ACHEMA 2012

30th World Exhibition Congress · Frankfurt am Main · 18 – 22 June 2012

Chemical Engineering · Environmental Protection · Biotechnology

PROGRAMME

ORGANIZERS OF ACHEMA 2012

DECHEMA

DECHEMA
Gesellschaft für Chemische Technik
und Biotechnologie e.V.

and

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INVITATION

Frankfurt am Main
18 – 22 June 2012

ACHEMA 2012
30th International Exhibition-Congress
on Chemical Engineering,
Environmental Protection and Biotechnology

703rd Event of the European
Federation of Chemical Engineering

346th Event of the European
Federation of Corrosion

Event of the European
Federation of Biotechnology

ACHEMA, the world's leading fair for the process industry, is again set to be the flagship event for the entire branch in 2012.

Nowhere is the heartbeat of process engineering faster, more intense, more up-to-date and international than at ACHEMA: ACHEMA is and remains the foremost event of our branch with a worldwide signalling effect. No other event has a comparable impact on our community. Innovation powerhouse, technology compass and communication hub – with this reputation ACHEMA attracts the complete Who's Who of the process industry to this technological summit.

At ACHEMA 2012 some 4,000 exhibitors from all over the world will showcase an impressive array of new developments, representing the innovative drive and dynamic thrust of the chemical and biotechnology industries together with the related supply industries along the whole value chain. One highlight is this year's Special Show on 'Innovative Energy Carriers and Storage'; given the energy turnaround in Germany, the selection of this theme reveals not only that ACHEMA keeps its finger firmly on the pulse, but is almost clairvoyant! A series of high-profile activities entitled 'BiobasedWorld at ACHEMA' addresses a further hot topic: the bio-economy.

What fresh momentum can ACHEMA inject into your day-to-day practice? Discover the latest technological trends and derive inspiration from the vast array of new developments and innovations at the most comprehensive and challenging technology show of our branch!

We cordially invite you to take part in ACHEMA 2012 and look forward to welcoming you to Frankfurt am Main in June.

DECHEMA
Gesellschaft für Chemische Technik
und Biotechnologie e.V.

Dr. Hans Jürgen Wernicke
Chairman

Dr. Michael Thiemann
Chairman of the ACHEMA Committee

Prof. Dr. Kurt Wagemann
Executive Director

OPENING SESSION

Sunday, 17 June 2012 **16:00 h**

CongressCenter Messe Frankfurt (CMF)

Overture

Welcome Address and Opening
by the Chairman of DECHEMA
Dr. Hans Jürgen Wernicke

Address
Dr. h.c. Petra Roth
Mayor of the City of Frankfurt


Dr. h.c. Petra Roth

Award
DECHEMAX Schools Competition
Dr. Hans Jürgen Wernicke

Speech
Günther Oettinger (to be confirmed)
Energy Commissioner, European Union

Thematic Introduction
The Energy Supply Post-Fukushima
Prof. Dr. Ferdi Schüth
Max Planck Institut für Kohlenforschung,
Mülheim an der Ruhr


Prof. Dr. Ferdi Schüth

Panel Discussion
The Energy Turnaround and the Chemical Industry – Opportunity or Threat?


Dr. Klaus Engel

Participants

Dr. Klaus Engel
President, Verband der Chemischen Industrie (German chemical industry association), Frankfurt


Dr. Rudolf Staudigl

Dr. Rudolf Staudigl
President & CEO,
Wacker Chemie AG, Munich


Prof. Dr. Fritz Vahrenholt

Prof. Dr. Fritz Vahrenholt
CEO, RWE Innogy GmbH, Essen


Prof. Dr. Uwe Schneidewind

Prof. Dr. Uwe Schneidewind
President, Wuppertal Institute for Climate, Environment and Energy

Moderator: Michael Opoczynski, ZDF, Mainz

Finale

Afterwards there will be a stand-up buffet in CongressCenter Messe Frankfurt. The addresses and lectures will be simultaneously translated.

Participation subject to registration
at www.achema.de/visit → Social Programme

Congress Topics

Exhibition Groups

Congress Topics	Exhibition Groups
Chemical leasing	**Research and Innovation**
Energy efficiency by integrated processes	
Recycling and urban mining	
ICOSSE International congress on sustainability, science and engineering	
Advanced fluids in process engineering	**Literature, Information, Learning and Teaching Aids**
Chemical nanotechnology	
Electrochemical technologies	
Chemical control legislation in East Asia	
E-Learning	
Laboratory and analytical techniques	**Laboratory and Analytical Techniques**
Sustainable laboratories	
Process analytics	
Hand-held spectrometers	
Advanced reaction engineering	**Engineering**
Energy efficiency by integrated processes	
Microreaction engineering	
Reaction modelling for layout and control	
Bionics	
Mixing and separation technology	**Mechanical Processes**
Ceramic membranes for challenging filtration tasks	
Solids processing	**Thermal Processes**
International powder & nanotechnology forum	
Plant components	**Pumps, Compressors, Valves and Fittings**
Pharmaceutical production	**Pharmaceutical, Packaging and Storage Techniques**
Experience in advanced pharmaceutical technology	
Safety	**Industrial and Labour Safety**
Sustainable laboratories – safety	
Plant control	**Instrumentation, Control and Automation Techniques**
Materials and materials testing	**Materials Technology and Testing**
Adhesive bonding	
Managing corrosion	
Bioprocesses	**General Topic Biotechnology**
Biorefineries and processing of renewables	
Single-use technologies	
New products through biotechnology	
Development and application of novel biocatalysts	
Raw materials for biotechnology	
Water for industrial use	**General Topic Environmental Protection**
Energy storage, transport and use	**Special Show and focus topic “Innovative Energy Carriers and Storage”**
CO_2 separation and utilisation	
Biofuels	

EXHIBITION
EXHIBITION GROUPS

The interdisciplinary exchange of ideas and experience between manufacturers, users, developers and scientists has always been a key concern of ACHEMA. Some 3,800 exhibitors are set to present a wide range of new developments, innovative products and interdisciplinary system solutions distributed over 15 hall levels covering around 140,000 m² exhibition space. Visitors to ACHEMA have a unique advantage: at no other event can a comparable concentration of technologies and solutions from all sectors of the process industry be experienced first-hand. The following keywords characterise the individual exhibition groups and provide an overview of the information available at ACHEMA. Branches are allocated to individual hall levels, so that visitors can pinpoint their areas of interest at a glance.

Environmental Protection and Biotechnology are integral, general themes and are, therefore, represented in all the halls.

Engineering

Halls 9.1, 9.2, outdoor area F1

Development, planning and execution of complete production units for all sectors of chemical engineering and biotechnology; catalysts, reactors, microtechnology; CAE – computer-aided engineering; process simulation and software; plants for water and wastewater treatment, waste gas treatment, waste disposal and recycling; services from the areas of logistics, production and financing; supply chain management; chemical parks.

Literature, Information, Learning and Teaching Aids

Passage 5.1 – 6.1

International publishers of scientific and technical literature specialising in: industrial chemistry, process engineering, biotechnology, measurement and control, materials sciences, environmental protection, information systems and databases; manufacturers of learning and teaching aids for universities and vocational training as well as for continuing education at all levels.

Mechanical Processes

Halls 5.0, 5.1, 6.0, outdoor area F1

Plant, apparatus, machines, equipment for mechanical processes, such as mixing, kneading, stirring, screening, filtering (including filter fabrics), centrifuging, crushing, grinding, agglomerating, homogenising, conveying, weighing; drive units and cleaning technology.

Industrial and Labour Safety

Hall 9.1

Safety concepts for chemical plants; equipment and measures for the protection of human life and the environment, such as breathing apparatus, oxygen apparatus, protective clothing, monitoring systems, explosion protection, sound insulation, anti-electrostatic techniques, transport of hazardous substances.

Laboratory and Analytical Techniques

Halls 4.1, 4.2, Foyer 4.1, outdoor area F1

Equipment, facilities, chemicals and services for research and industrial laboratories; laboratory planning and equipment; apparatus for physical and chemical analysis, including sample preparation: weighing and dosing techniques, spectroscopy, chromatography and all related areas, surface analysis, environmental analysis, laboratory diagnostics and laboratory automation; services and contract analysis.

Instrumentation, Control and Automation Techniques

Halls 11.0, 11.Via, 11.1

Industrial measurement and control equipment, systems for automatic control and monitoring of operations and processes; data processing systems and programmes for chemical science and engineering, process computers and microprocessors; analytical apparatus for continuous concentration measuring and production control, sensors; electrical engineering systems, equipment and components.

Pharmaceutical, Packaging and Storage Techniques

Halls 3.0, 3.1, outdoor area F1

Apparatus and machinery for dosing, moulding, filling, sealing, packing, labelling and inspection as well as packaging materials; machinery for the production, manufacture and packaging of drugs; transportation and storage techniques.

Thermal Processes

Halls 4.0, 5.1, 6.1, outdoor area F1

Plant, apparatus, machines, equipment for thermal processes, such as distilling, rectifying, extracting, absorbing, crystallising, drying, heating and cooling; electrochemistry, membrane processes, bioreactors, biorefineries, synthetic fibre processes, power generation, heat pumps, heat transfer and insulation techniques; clean-room technology, air-conditioning, industrial gases.

Pumps, Compressors, Valves and Fittings

Halls 8.0, 9.0, 9.1, 11.0

Pumps and compressors for all media, for different operating conditions and loads; valves, fittings, pipelines, seals and packings; high-pressure cleaning equipment.

Materials Technology and Testing

Hall 11.0

Metallic and non-metallic materials and composites for chemical engineering, technical apparatus and equipment made of these materials, surface protection (e.g. enamelling, plating, plasma spraying, coating, refractory linings), welding and joining techniques, microscopy; equipment for physical and chemical testing of materials, materials analysis, metallography, physical surface measurements, diffraction analysis, non-destructive materials testing, component testing, quality assurance techniques during operations.

Research and Innovation

Hall 9.2

Areas of work, study courses and research results of university institutes and research establishments in Germany and abroad, relating predominantly to the scientific fundamentals of chemical engineering: industrial chemistry, process engineering, measurement and control, mechanical and plant engineering, materials sciences, environmental protection, biotechnology.

Group Stands

- CBI Centre for the Promotion of Imports from Developing Countries, Rotterdam
- CMEC International Exhibition Co. Ltd., Beijing
- EMCLAB, Duisburg
- EurExpo, Alexandria
- EXCELLENCE 4 LAB
- Excellence United – The Community of Experts
- Field Communication Lounge
- FLUIDEX Asociación Española de Exportadores de Equipos para Manipulación de Fluidos, Bilbao
- French Pavilion
- GAMBICA Association Ltd., London
- India Pavilion (EEPC)
- Korea Scientific Instruments Industry Cooperative, Seoul
- PEMA Process Equipment Manufacturers' Association, Falls Church
- VBU – Vereinigung deutscher Biotechnologie-Unternehmen
- VMA Valve Manufacturers Association of America, Washington
- ZPT Zentrale für Produktivität und Technologie Saar e.V.

General Topic Biotechnology

Biotechnology and its supplier branches are a well established, integral component of ACHEMA. In 2012, this field will be integrated into BiobasedWorld at ACHEMA, thus sharpening its profile. At the exhibition, suppliers, technology developers and end-users will present new methods of processing biomass, plant and equipment for biotechnological processes and biobased products for the chemical and pharmaceutical industries and the food and cosmetics branches. A special focus will be on the increasing use of renewable resources for a wide range of applications and the refinement of biocatalytic and biotechnological production processes; the latter have received a tremendous boost from new insights from 'omics research, synthetic biology and optimised cell culture techniques. The whole spectrum of biotechnological applications will be represented – from large-scale fermenters to single-use bags.

Environmental protection and resource conservation

Integrated environmental protection, technologies for efficient use and conservation of our resources as well as processes for the control of emissions into the air, water and soil constitute a general topic that is an integral part of all ACHEMA exhibition groups. Some 1,000 exhibitors at ACHEMA will introduce the latest processes, plants, equipment and services. The most important themes are:

- conservation of energy and natural resources
- industrial water treatment and wastewater treatment
- waste technology and regeneration of resources
- air pollution control
- environmental measurement techniques and analysis

The increasing scarcity of resources, e.g. strategic raw materials and energy carriers, calls for sustainable use of residual materials as a source of materials and energy and for cost-cutting by applying efficient, environmentally friendly processes. An increasing demand for lower tolerance thresholds for air and water pollution can be observed on a global scale. All these factors require sustainable solutions. Innovative concepts, taking these considerations into account, are crucial to existing production locations and to export-oriented plant and apparatus engineering.

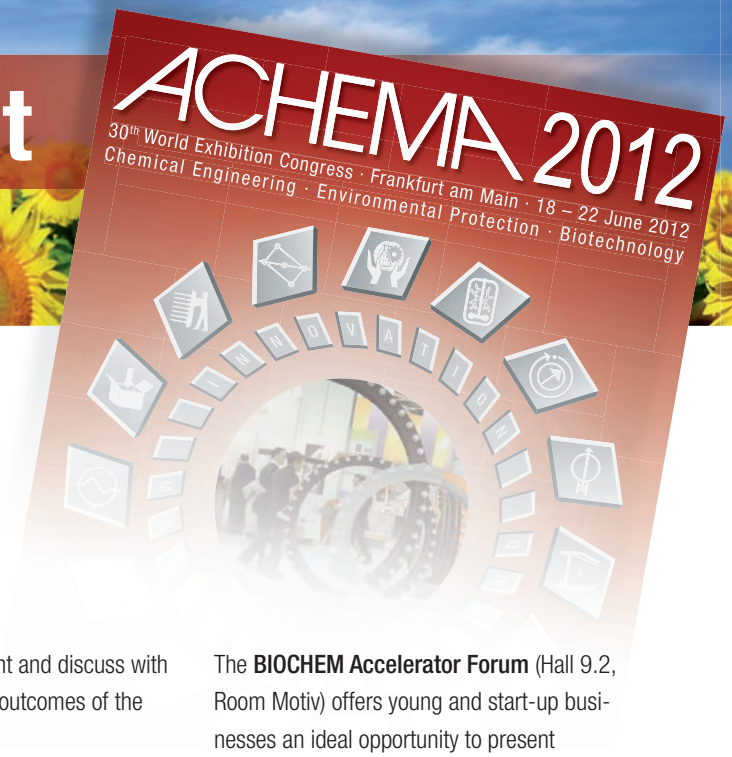
Special Show and focus topic "Innovative Energy Carriers and Storage"

Large areas of everyday life are now inconceivable without energy storage in all its varied forms. From mobile telephones to computers and motor vehicles through to residential buildings and industrial plants: efficient storage of energy – and its low-loss transport – plays a key role. The very timeliness of this theme is underscored by the energy revolution in Germany which, especially in the industrial environment, in turn raises the issue of the stability of the power networks.

In this connection, it is indisputable that there is an urgent need for far-reaching technological advances in the foreseeable future. It is similarly indisputable that the materials and innovations will emanate from the heart of the process industry. In this context, ACHEMA 2012 once again has its finger on the pulse of the times, guaranteeing that this 'hot' focus topic will act as a stimulus to the entire branch.

Technology areas involved:
Chemical energy storage, solar chemical processes; photovoltaic materials and applications; innovative battery concepts and supercapacitors; advances in fuel cell technology; e-mobility strategies; the hydrogen economy; stability of the power network and emergency power supply; use of industrial waste heat for power generation.

BiobasedWorld at



BiobasedWorld at ACHEMA – showcase for the international bioeconomy

An increasing proportion of the chemical industry's basic chemicals, polymers, building materials, pharmaceutical precursors, fuels, lubricants, materials, fine chemicals and many other products, is produced from renewable resources. The transition to the bioeconomy is already underway; it is poised to transform major industrial branches and markets and to trigger new products and processes. In this context, the innovative power of biotechnology plays a pivotal role.

It goes without saying that ACHEMA 2012, the unrivalled forum for new trends in the process industry, will address these developments, thus testifying to the global importance of the bioeconomy:

BiobasedWorld at ACHEMA offers exhibitors and visitors from all sectors of the biobased economy a platform for interdisciplinary exchange; it is an ideal environment for getting your foot in the door of the bioeconomy and related branches, such as the chemical, textile and paper industries. Supplementing the exhibition and congress programmes, BiobasedWorld at ACHEMA also features the Technology Transfer Days, a BIOCHEM Accelerator Forum and ACHEMA Partnering.

The **exhibition** will showcase products, services and new developments, ranging from technologies, processes and services for treating biomass and producing biobased chemicals and biofuels through to designing biorefineries.

The bioeconomy also figures strongly in the **ACHEMA Congress**. Four parallel lecture series give valuable insight into the latest research findings, market-oriented developments, and political and regulatory aspects of the biobased economy. In the two-day lecture series "European Innovation Partnership: From knowledge via demonstration to products and markets", high-ranking players from industry and members of the EU Commission will present and discuss with you the aims, experience and outcomes of the bioeconomy.

Take advantage of the **Technology Transfer Days** (21 June to 22 June 2012, Hall 9.1, Rooms Logos/Genius) of BiobasedWorld for a preview of the products, processes and services that will be market-ready in the short to medium term. Researchers and entrepreneurs should grasp this opportunity to present their latest developments to the movers and shakers of industry. The Technology Transfer Days offer businesses an effective means of pinpointing tomorrow's products and processes for their portfolios.

ACHEMA Partnering (Hall 9.2) makes it easy for visitors to selectively identify and quickly establish contact with potential cooperation and business partners. Two months before ACHEMA, registered exhibitors and visitors can already begin scheduling appointments for meetings at ACHEMA.

The **BIOCHEM Accelerator Forum** (Hall 9.2, Room Motiv) offers young and start-up businesses an ideal opportunity to present themselves personally to European investors at the **Venture Capital Day** (Hall 9.2, Room Impuls). For investors this is a good chance to catch up on attractive investment options at first hand. Further features of the Forum include the Technology Transfer Days, focusing on the bioeconomy, and a related Partnering scheme. The **Teaching Classes for SMEs** (Hall 9.2, Room Motiv) will give an in-depth presentation of tools developed in the framework of the EU BIOCHEM Project. The rationale is to give SMEs the necessary competence for a successful entry into the bioeconomy.

Under the motto "**The Tangible Bioeconomy**", an array of exhibits in the Galleria will provide a tangible demonstration of the potential of the bioeconomy.

www.achema.de/biobasedworld
www.achema.de/partnering
www.achema.de/technologytransfer
www.achema.de/acceleratorforum

ACHEMA online

ACHEMA online, the ACHEMA website, contains detailed, up-to-the-minute information on the exhibition, participating companies and research institutions, the congress programme, guest events as well as our comprehensive services for visitors, exhibitors and journalists.

Our completely revamped website can be found at www.achema.de. With just a few clicks you can discover everything you need to know about ACHEMA.

HOME

The Start page brings up-to-date news on ACHEMA, links and addresses of our worldwide network and a wealth of information at your fingertips in a flash by download.

EXHIBITION

"Exhibitors and Products" gives extensive information on companies from all the branches represented at ACHEMA. User-friendly search functions enable you to pinpoint suppliers of products and services or competent partners from research and industry quickly and selectively, and to contact them directly if you wish.

THE KEY FEATURES AT A GLANCE:

- all exhibitors with address, hall/stand together with hall plans and routes
- short profile of the field of activity in German and English
- detailed presentation of selected products
- new developments, improved processes and tailored services
- potential cooperation partners for research or production
- licences offered or wanted
- interested parties for agencies offered or wanted
- addresses of branches and subsidiaries worldwide
- other potential suppliers of the equipment you require

Search and sort functions and our detailed keyword index are a quick means of finding content you are really interested in and forging new business relationships before the event starts. Once you have registered, all the contact addresses and extended functions will be available to you:

- "My List" feature
- save search profiles
- post individual notes
- direct inquiries to manufacturers about specific products
- address export for personal contacts

VISIT

Information from A for arrival, including flights, train and local transit connections, to Z for Zip Code can be found under the main menu item "Visit". Here it is also quick and easy to order an admission ticket and print it out at home. For international visitors, the contact details of chambers of commerce, travel agents and other organisations in 22 countries are available.

CONGRESS

With over 900 lectures, the congress programme of ACHEMA 2012 addresses the entire spectrum of process engineering. To select individual events from the extensive range, it is best to use our congress planner. This tool helps you to search for lecture topics, keywords or authors and to draw up your own individual programme for a specific day. An overview of all the lecture series is also provided in this Programme brochure on pages 32 and 33.

ON THE BALL WHILE ON THE GO!
THE NEW ACHEMA APP

- If you want to look up which exhibitors at ACHEMA offer a certain product or can assist you in implementing a current project while you are travelling without your laptop
- If, just before your visit to the fair, you are short of time and need to compile a list of company stands you simply must see
- and if you also happen to have a smartphone, then you cannot beat the new ACHEMA app!

From mid-May 2012 onwards, it gives you access to all exhibitors from A-Z with a short profile of their business fields or products, searchable by name, exhibition group, product category, hall level and origin. To round it off, an overview plan of the exhibition grounds and detailed hall plans make it easy to find the stands of interest. Besides general information on ACHEMA, it goes without saying that the ACHEMA app also enables you to select and schedule lectures from the congress programme. This means your personal, interactive ACHEMA planner will always be at your finger-

tips. The ACHEMA app will come in 2 versions: for Apple iPhone (from iOS 4.0) with the option of daily updated contents, and as a web app with online access to exhibition and congress data (smartphone with Internet access required). Ideally, bookmark the website where the application is located now: www.achema.de!

COMPASS
VISITOR INFORMATION AND DIRECTIONS

A visit to an event like ACHEMA requires careful preparation. There can be no more suitable tools than ACHEMA online and our new mobile apps for smartphones. On the exhibition grounds, visitors can also take advantage of COMPASS, the on-site visitor information and orientation system located at all entrances and in most halls.

Information on exhibitors and their products provided by our qualified staff is based on the information contained in the keyword index of the ACHEMA 2012 catalogue.

Catalogue ACHEMA 2012

The catalogue will be published in two volumes in time for the opening of ACHEMA 2012.

PART 1
contains an index by hall and an alphabetical index of exhibitors.

PART 2
contains a short index of exhibitors, keyword index, index of brand names, index of exhibitors classified by country and exhibition group.

All visitors registered by name can pick up the exhibition catalogue at one of the ACHEMA publication counters in the entrance halls. Day visitors can purchase the catalogue on the exhibition grounds, price € 25.–.

The catalogue is free of charge to congress participants with a season ticket (including entitlement to publications).

Congress publications

Abstracts of the lectures will be available at http://kongress.achema.de/congressplanner.

Information services for the press

ACHEMA ONLINE – PRESS SERVICES

- Press releases on ACHEMA
- Trend reports on selected themes of ACHEMA 2012
- Logos, graphics, multimedia
- Schedule
- Exhibitors' online press displays

ACCREDITATION

- Online at http://presse.achema.de
- Sunday, 17 June 2012, 11:30–15:30 h in DECHEMA House
- Monday, 18 June 2012 to Friday, 22 June 2012 in the ACHEMA Press Centre
- Additionally, Monday, 18 June 2012 only, accreditation counter in the Press car park

ACHEMA ON-SITE PRESS CENTRE

The **Press Centre in Torhaus, Level 4**, will be at the disposal of journalists every day from 18–22 June 2012.
Opening times during ACHEMA:
Monday to Friday from 8:30 to 18:30 h

- Trend reports and daily updated information
- Accreditation, photo/film permits
- Workstations with Internet access
- Press displays of exhibitors
- Lockers

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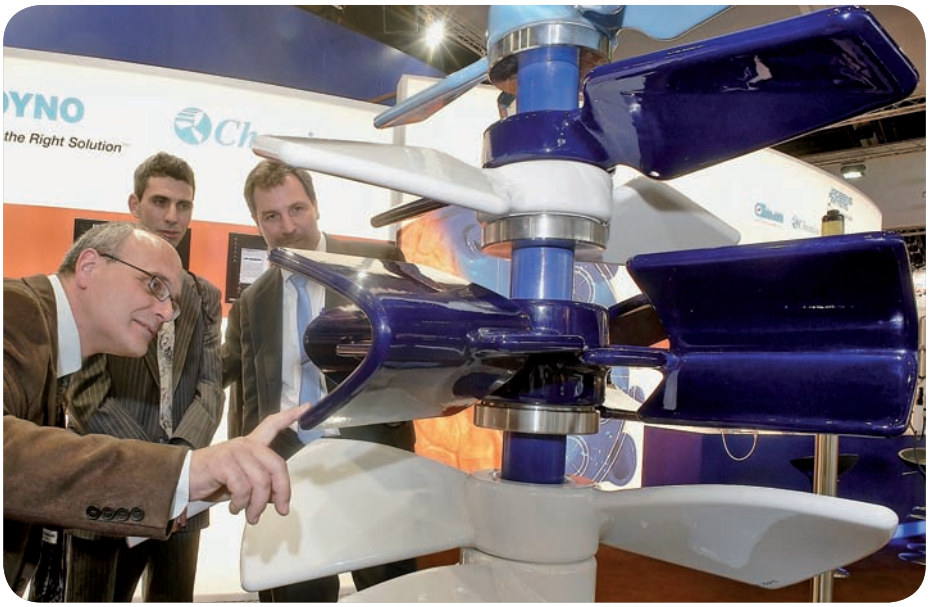
During ACHEMA the Press Office will be located on the exhibition grounds in the Press Centre, Torhaus Level 4. Telephone and e-mail details will remain unchanged during ACHEMA.



ECONOMIC PRESS CONFERENCE

Monday, 16 April 2012 10:00 h

Paul Duden Room, DECHEMA House

Representatives from important branches of ACHEMA will present information about the current economic situation and technological trends.

OPENING PRESS CONFERENCE

Sunday, 17 June 2012 13:00 h

Max Buchner Auditorium, DECHEMA House

The press conference giving the latest run-down on ACHEMA is the launch pad for the Opening programme.

INTERIM PRESS CONFERENCE

Wednesday, 20 June 2012 10:00 h

ACHEMA Press Centre, Torhaus, Level 4

The latest figures, the general 'feel' and the trends at half-time

PRESENTATION OF THE ACHEMA MEDIA AWARD (SEE P. 13)

Monday, 18 June 2012 17:00 h

Forum, Level 1
Room Panorama 2

MEET YOUR FRIENDS (SEE P. 56)

Monday, 18 June 2012 from 18:00 h

Forum, Ebene 0
(by special invitation)

ACHEMA worldwide Business Forum

Tuesday, 19 June 2012 10:30–12:30 h

Hall 4.0, Room Europa

CHINA'S PROCESS INDUSTRY PICKING UP THE PACE

A cornerstone of the Chinese process industry reveals strategic insights:

- China's pharmaceutical sector on the verge of becoming the world's largest pharma market

with contributions from

- China Pharmaceutical Association of Plant Engineering
- Shanghai Tofflon
- Shanghai Tianxiang & Chentai Pharmaceutical Machinery Co.
- NNE Pharmaplan, Bad Homburg/Germany

followed by a snack at lunchtime, an opportunity for informal talks

Moderator: Thomas Scheuring,
Frankfurt am Main/ Germany

This event will be held in English.

ACHEMA Media Award

Monday, 18 June 2012 17:00 h

Forum, Level 1
Room Panorama 2

Award lecture
Prof. Dr. Dr. Dr. Hanns Hatt, cell physiologist and smell scientist

Award presentation
Dr. Hans Jürgen Wernicke,
Chairman of DECHEMA

Hanns Hatt has established a widespread reputation as a smell scientist. He combines outstanding scientific achievements with the gift of making them understandable to a broader public. Hanns Hatt is Professor of Cell Physiology at Ruhr-Universität Bochum and President of the "Nordrhein-Westfälische Akademie der Wissenschaften und Künste" (North Rhine-Westphalia Academy of Sciences and Humanities). The honours awarded him include the Communicator Award 2010 of the DFG (German research foundation) and the Robert Pfleger Research Prize 2010.

In 2012, for the first time the ACHEMA Media Award will no longer be restricted to one medium. It recognises a contribution across all media platforms, including TV, radio, print or online, which successfully communicates a theme from the ACHEMA spectrum to a broader public.

Why not follow up the Media Award ceremony with a visit to "Meet your Friends" (see p. 56)?

CONGRESS
PLENARY LECTURES – PANEL DISCUSSIONS

Panel Discussions

Forum, Level 0

Monday, 18 June 2012 11:00–12:30 h

Bioökonomie

K. Wagemann, DECHEMA e.V., Frankfurt/D (Moderation)
C. Neumann, Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV), Berlin/D
M. Fleckenstein, WWF Deutschland, Berlin/D
L. Guderjahn, CropEnergies AG, Mannheim/D
J. von Braun, Universität Bonn/D
H. Zinke, BRAIN AG, Zwingenberg/D

Tuesday, 19 June 2012 11:00–12:30 h

Abfall als strategische Ressource von morgen

T. Hirth, Fraunhofer-Institut für Grenzflächen- und Bioverfahrenstechnik IGB, Stuttgart/D (Moderation)
M. Faulstich, TU München/D
E. Lox, Umicore AG & Co. KG, Olen/B
H. Wilms, REMONDIS Assets & Services GmbH & Co. KG, Lünen/D
T. Schmid-Unterseh, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU), Berlin/D

Wednesday, 20 June 2012 11:00–12:30 h

Der schnellste Weg zur Elektromobilität – was ist die beste Innovationsstrategie?

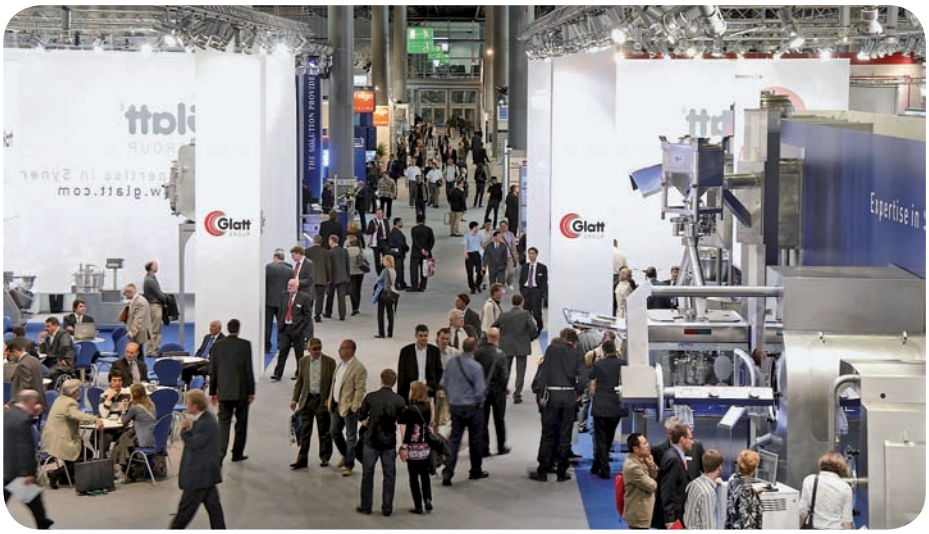
J. Stebani, polyMaterials AG, Kaufbeuren/D (Moderation)
A. Gutsch, Karlsruher Institut für Technologie (KIT)/D
R. Meixner, BASF Future Business GmbH, Ludwigshafen/D
M. Winter, Universität Münster/D
H. Kohler, Daimler AG, Stuttgart /D

Thursday, 21 June 2012 11:00–12:30 h

Sicherheitsforschung in der Nanotechnologie

O. Renn, DIALOGIK gemeinnützige Gesellschaft für Kommunikations- und Kooperationsforschung mbH Stuttgart/D (Moderation)
M. Büning, Bundesverband der Verbraucherzentralen und Verbraucherverbände – Verbraucherzentrale Bundesverband e.V. (vzbv), Berlin/D
T. Epprecht, Zumikon/CH
A. Grunwald, Karlsruher Institut für Technologie (KIT)/D
P. Krüger, Bayer MaterialScience AG, Leverkusen/D
H. Krug, Empa, ST. Gallen/CH
R. Buschmann, Verbraucherzentrale NRW, Düsseldorf/D

The panel discussions will be held in German.



Plenary Lectures

Monday, 18 June 2012 13:30 h

CongressCenter Messe Frankfurt (CMF), Room Harmonie 3

Unlimited energy from the Sahara, a sound future for many people

P. van Son, Dii GmbH, München/D

Tuesday, 19 June 2012 13:30 h

Hall 9.2, Room Dialog

Brighter living with enzymes

O. May, DSM Pharmaceutical Products, Geleen/NL

Wednesday, 20 June 2012 13:30 h

CongressCenter Messe Frankfurt (CMF), Room Harmonie 1

Recycling of technology metals – a key contribution to secure a sustainable supply

C. Hagelüken, Umicore AG & Co. KG, Hanau/D

Thursday, 21 June 2012 13:30 h

CongressCenter Messe Frankfurt (CMF), Room Harmonie 1

Future scope of Chemical Engineering in a rapidly changing world

J.C. Schouten, TU Eindhoven/NL

The plenary lectures will be held in English.
We reserve the right to make changes to the programme.

Automation Dialog at ACHEMA 2012

Monday, 18 June – Friday, 22 June 2012
Portalhaus (Hall 11), Level VIA, Room Frequenz

At ACHEMA 2012, the organizations NAMUR, ARC Advisory Group, and ZVEI will again host their joint forum "Automation Dialog". On all five exhibition days, interesting panel discussions will bring together suppliers, users, solution providers, consultants, and government representatives to speak about important process automation topics. For the first time in 2012, Field Communication Lounge and FDI Cooperation will join us to support the presentation of selected topics.

The panel discussions will deal with various trends and topics such as energy and resource efficiency, IT security in automation, and wireless communication in the process industries. In addition, visitors will have the opportunity to gather information about the latest developments in explosion protection and functional safety.

"Automation Dialog" will take place in the VIA level conference room of Hall 11. The panel discussions will be held in German or English. Simultaneous translation will be provided so that international visitors can follow the contributions and participate in the discussions.

Schedule Automation Dialog

ARC Advisory Group NAMUR ZVEI

Time	Mon. 18 June 2012	Tues. 19 June 2012	Weds. 20 June 2012	Thur. 21 June 2012	Fri. 22 June 2012
10:30 – 11:20 h		Automation Security	How Much Communication Does the Process Industry Need?	Energy Efficiency in EPC Solutions	FDI – The Common Solution to Device Management?
11:30 – 12:20 h		Supply Chain Integrity and Brand Protection	Field Device Diagnostics: Desire and Reality	Resource Efficiency through MES?	Do Factory and Process Automation Need Different Networks?
12:30 – 13:20 h	Market Status and Discussion on Emerging Changes in Solution Lifecycle Management				
14:00 – 14:50 h	What´s New in Explosion Protection?	Service – Maintenance – Outsourcing	Operational Excellence	Optimizing Lifecycle Costs: Hype or Does Energy Efficiency Really Pay Off?	
15:00 – 15:50 h	Process Simulation: Is It Worth the Effort?	Advanced Process Control: New Requirements from Process Engineering	Trends in Functional Safety	Process Analytics in Biotechnology	

VDI Verfahrenstechnik und Chemieingenieurwesen

Information platform for production engineers

Thursday, 21 June 2012 **14:30 h**

Forum, Level 0

The "Information platform for production engineers" is an initiative of VDI-GVC (Association of German Engineers), addressing practice-oriented problems confronting production engineers and all aspects of the production plant.

The concept, which facilitates a practice-oriented exchange of ideas and experience within a region and has already been established in five regional groups, will be presented and moderated by experts. Typical tasks of production engineers, such as technical modifications, use of thermal imaging cameras, flange assembly, a training concept for contractors, etc. will be explained and discussed on the basis of short contributions.

The event will be held in German.

Harmonie 1, CMF

Energy efficiency by integrated processes

Chemical and biotechnological processes

10:30 **Keynote Lecture**
Synthesis gas – production & application
S. Muschelknautz, P. Fritz, Linde AG, Pullach/D

11:00

11:30 **Integrated design and optimisation of a new HPPO process for reduced energy consumption**
A. Cano, Process Systems Enterprise, Inc., Cedar Knolls, NJ/USA; H. Martin Rodriguez, Repsol, Madrid/E

12:00 **Integrated bioprocess for continuous biobutanol production coupled to organophilic pervaporation**
W. Van Hecke, P. Van De Zande, S. Claes, S. Vangeel, H. Beckers, H. De Wever, VITO – Flemish Institute for Technological Research, Mol/B

12:30 **Methodical approach for the integration of recycling strategies into downstream of pharmaceutical bioprocesses**
F. Grote, H. Froehlich, TU Clausthal/D; R. Ditz, Merck KGaA, Darmstadt/D; J. Strube, TU Clausthal/D

Harmonie 2, CMF

Safety

European safety regulation/Seveso

Seveso III directive
T. Fiedler, Federal Environment Agency (UBA), Dessau-Roßlau/D

Climate change and process safety
C. Jochum, Commission on Process Safety, Bad Soden/D

Appropriate distances according to article 12 Seveso-II-Directive – German approach
N. Wiese, Northrhine-Westphalia State Agency for Nature, Environment and Consumer Protection, Recklinghausen/D

Land use planning according to article 12 of the Seveso II directive
H. Becher, Merck KGaA, Darmstadt/D

Process safety and human factor competence
U. Fischbach, Arbeitsschutz, Umweltschutz und Anlagensicherheit, Basel/CH

Harmonie 3, CMF

Energy storage, transport and use

Electrochemical energy storage

Determination of state-of-charge and state-of-health for lithium-polymer batteries
K. Holve, J. Roes, A. Heinzel, University of Duisburg-Essen/D

Three-dimensional modelling of lithium ion batteries on the macro- and microscale
J. Zausch, A. Latz, Fraunhofer ITWM, Kaiserslautern/D

Electrochemistry of nanosized $LiFePO_4$/C composite materials
N.A. Hamid, University of Duisburg-Essen/D; S. Wennig, B. Oberschachtsiek, Centre For Fuel Cell Technology, Duisburg/D; H. Wiggers, C. Schulz, University of Duisburg-Essen/D; A. Heinzel, Centre For Fuel Cell Technology, Duisburg/D

Advantages and research challenges of future applications of re-chargeable zinc-air batteries
D. Movrin, St. Weinberger, V. Hacker, W. Taucher-Mautner, TU Graz/A; J. Pitayatara-torn, Panergy Biofuels GmbH, Oberwart/A

Energy storage technologies for stationary & mobile applications – applications, requirements and challenges
D.U. Sauer, J. Kowal, M. Leuthold, RWTH Aachen/D

Harmonie 1, CMF

Mixing and separation technology

Filtration media and modelling

14:00 **13.30 Plenary lecture**
cf. room Harmonie 3, CMF

14:30 **The design and validation of woven filter media using CFD modelling**
M. Knefel, GKD – Gebr. Kufferath AG, Düren/D

15:00 **Characterisation and spinning of highly porous aerocellulosic fibres for application in technical textiles**
B. Schulz, G. Seide, T. Gries, RWTH Aachen/D; I. Kayacan, B. Milow, L. Ratke, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Cologne/D

15:30 **New vacuum filter belts for liquid solid separation**
C. Maurer, SEFAR AG, Thal/CH

16:00 **Simulation of filter fabric/particle interaction**
J. Barth, S. Ripperger, TU Kaiserslautern/D; S. Rief, A. Wiegmann, Fraunhofer ITWM, Kaiserslautern/D; E. Laourine, C. Cherif, TU Dresden/D

16:30 **Mathematical modelling and numerical simulation of filter elements**
O. Iliev, M. Kabel, R. Kirsch, Z. Lakdawala, E. Toroshchin, Fraunhofer ITWM, Kaiserslautern/D; M. Dedering, IBS Filtran GmbH, Morsbach-Lichtenberg/D

17:00 **Comparison of measured deposition rates and simulation of submicron particles at various filter media**
A. Hellmann, K. Schmidt, S. Ripperger, University of Kaiserslautern/D; M. Berges, J. Pelzer, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), Sankt Augustin/D

Harmonie 2, CMF

Safety

Concepts and methods

HAZOP – a review on 40 years of application, trends and challenges in a changing community and legal environment
R. Semmler, TÜV SÜD Chemie Service GmbH, Frankfurt/D

Explosion protection by steam inertisation: minimising emissions
F. Westphal, J. Franke, consilab Gesellschaft für Anlagensicherheit mbH, Frankfurt/D; R. Bierbaum, Clariant Produkte (Deutschland) GmbH, Frankfurt/D

New techniques for high-fidelity dynamic modelling of depressurising vessels and flare networks to improve safety and reduce CAPEX
J. Marriott, Z. Urban, A. Giovanoglou, Process Systems Enterprise Limited, London/UK

Production and conversion of phosgene: inherently safe processing of a hazardous chemical
M. Stumpf, Buss ChemTech AG, Pratteln/CH

Safety handling of drums containing hazardous waste
Z.A. Osman, P. Röhrs, HIM GmbH, Biebesheim/D; T. Steffens, Giessen University of Applied Sciences/D

Secure sterilisation of potentially infectious waste using innovative steam injection technology
C. Grumbach, Giessen University of Applied Sciences/D; T. Pillich, C. Rühl, biomedis GmbH, Giessen/D; P. Czermak, Giessen University of Applied Sciences/D

Structural design for explosion protection for technical centres and experimental bunker – proceeding explanation for the model choice and the dimensioning
A. Schreck, Großmann Ingenieur Consult GmbH, Dresden/D; H. Krebs, BAM Federal Institute for Materials Research and Testing, Berlin/D; R. Woiwode, Großmann Ingenieur Consult GmbH, Dresden/D

Harmonie 3, CMF

Energy storage, tranport and use

Hydrogen

13.30 Plenary lecture
Unlimited energy from the Sahara, a sound future for many people
P. van Son, Dii GmbH, Munich/D

Renewable hydrogen production
R. Eckl, J. Ferstl, Linde AG, Pullach/D

Material selection for next generation energy processes: the use of tantalum surface alloys for hydrogen production in strong acid systems at temperatures beyond 250°C
B. Gillesberg, Tantaline, Nordborg/DK; D. Gambale, Tantaline, Waltham, MA/USA

Generation of „green“ hydrogen and energy via syngas from renewable, non-food feedstocks
M. Wolperdinger, U. Welteroth, Linde Engineering Dresden GmbH/D

A future energy supply based on liquid organic hydrogen carriers (LOHC)
D. Teichmann, W. Arlt, P. Wasserscheid, University of Erlangen-Nuremberg/D

Bio-hydrogen production from the digestion of starch using mixed cultures
B. Meidan, H. Su, J. Baeyens, T. Tan, Beijing University of Chemical Technology/PRC

The potential for inexpensive decentralised hydrogen production
V. Hacker, S. Nestl, M. Wegleiter, TU Graz/A

Harmonie 4, CMF

Mixing and separation technology

Ceramic membranes for challenging filtration tasks*

Ceramic membranes – potentials of optimisation related to application
P. Bolduan, P. Mund, atech innovations gmbh, Gladbeck/D

Ceramic nanofiltration membranes – state of the art and examples of application
V. Prehn, M. Schulze, inopor GmbH, Veilsdorf/D; K. Herrmann, inopor GmbH, Schmalkalden/D; D. Sittig, inopor GmbH, Veilsdorf/D

New ceramic nanofiltration membranes with a cut-off below 450 D
I. Voigt, P. Puhlfuerss, K. Herrmann, S. Duscher, H. Richter, Fraunhofer IKTS, Hermsdorf/D

Process engineering to apply ceramic nanofiltration membranes
A. Stobbe, Andreas Junghans – Anlagenbau und Edelstahl-bearbeitung, Frankenberg/D

Practical aspects in applying organic solvent nanofiltration in specialty chemicals production
S. Zeidler, U. Kätzel, Merck KGaA, Darmstadt/D; P. Kreis, Evonik Industries AG, Marl/D

*organised by I. Voigt, Fraunhofer IKTS, Hermsdorf/D

Spektrum, CMF

Process analytics*

Industrial applications

Solutions for the process analytics using the new PGC5000 platform
K.-P. Sandow, ABB Automation GmbH, Ratingen/D

Inline-monitoring of process sprays based on statistical extinction method
F. Dannigkeit, S. Ripperger, TU Kaiserslautern/D

Applications of process analytical technologies for the development of scalable industrial crystallisation processes
L. Helmdach, University of Halle-Wittenberg/D; M.P. Feth, Sanofi-Aventis Deutschland GmbH, Frankfurt/D; J. Ulrich, University of Halle-Wittenberg/D

In-situ monitoring of industrial sugar crystallisation processes by single-frequency ultrasound
D. Pertig, T. Stelzer, J. Ulrich, University of Halle-Wittenberg/D

IEDAE: Interactive exploratory data analysis environment
E. Salzmann-Manrique, Frankfurt University of Applied Sciences/D; A. Orth, Umesoft GmbH, Eschborn/D

* co-organised by joint working party of GDCh and DECHEMA „Process Analytical Technology“

Conclusio 1, CMF

Sustainable laboratories

Concepts and buildings*

10:30 **Transforming laboratory facility management through building information management**
P. Wirdzek, I2SL International Institute for Sustainable Laboratories, Annandale, VA/USA; R. Blakey, IFMA R&D Counsel, Seattle, WA/USA; D. Smith, SMART Alliance NIBS, Washington, DC/USA; J. Jones, TU Virgina, Blacksburg, VA/USA

11:00 **Strategies for a sustainable operation of laboratory buildings – perspectives and objectives driven from european stakeholders association**
E. Dittrich, EGNATON e.V., Bensheim/D

11:30 **Case study – new construction of Daniel F. and Ada L. Rice plant conservation center at the Chicago botanic garden**
D. Doyle, Grumman/Butkus Associates, Evanston, IL/USA

12:00 **The U.S. federal sustainability efforts: an update**
B. Shearer, Beth Shearer & Associates Inc., Arlington, VA/USA

12:30 **Introducing the 4 levels of flexibility in sustainable laboratory building design and construction process**
A. Antelo, A. Altube, High Identity Buildings, S.L., Ondarroa/E

* in cooperation with EGNATON e.V., Bensheim/D; Labs 21/USA

Harmonie 4, CMF

Mixing and separation technology

Membrane processes

13.30 Plenary Lecture
cf. room Harmonie 3, CMF

New concepts for the starch industry: glucose demudding by a decanter membrane synergy process
F. Lipnizki, M. Nilsson, Alfa Laval Copenhagen, Søborg/DK

Application of supported liquid membrane (SLM) technology in recycling of Li^+ from battery scrap leachate
H. Noll, M. Fritz, M. Siebenhofer, TU Graz/A

Hydrophobic membranes in membrane contactor configuration for water recovery
F. Macedonio, E. Drioli, A. Brunetti, G. Barbieri, National Research Council, Rende/I

Small scale membrane contactors for separation in finechemical processes
C.P.M. Roelands, I.S. Ngene, M.P. de Graaff, TNO, Delft/NL

Influence of air sparging with periodical relaxation filtration on submerged flat sheet microfiltration performance
N. Dang, University of Linz/A

Online oil content monitor for optimisation of oily waste water treatment process with tubular ceramic membranes
M. Ebrahimi, S.J. Kerker, S. Aslan, J. Hild, Giessen University of Applied Sciences/D; A.A. Schmidt, DECKMA HAMBURG GmbH/D; P. Mund, 3Atech innovations GmbH, Gladbeck/D; P. Czermak, Giessen University of Applied Sciences/D

Spektrum, CMF

Process analytics*

Novel techniques

Keynote lecture
Modern techniques for reaction online monitoring – an industrial perspective
W.-D. Hergeth, E. Frauendorfer, A. Wolf, Wacker Chemie AG; Burghausen/D

Laser measurement technology for the assessment and alignment of recips
H. Lankenau, NEAC Compressor Service GmbH & Co. KG, Übach-Palenberg/D

Investigation of liquid hold-up in structured packings under flooding conditions using ultra-fast electron beam X-ray tomography
A. Janzen, University of Paderborn/D; F. Barthel, M. Schubert, U. Hampel, Helmholtz-Zentrum Dresden-Rossendorf/D; E.Y. Kenig, University of Paderborn/D

Ultrasonic clamp-on measurement – an alternative to coriolis?
J. Wylamrzy, FLEXIM GmbH, Moers/D; I. Panicke, FLEXIM GmbH, Berlin/D

Micro total evaporator for online analytics
K. Nagy, J. Heck, Ehrfeld Mikrotechnik BTS GmbH, Wendelsheim/D; B. Schilling, A. Plum, Bayer Technology Services GmbH, Krefeld/D

Emulsion stability evaluation via optical spectroscopy
B. Glasse, IWT Bremen/D; U. Fritsching, University of Bremen/D; R. Guardani, C. Takahashi, University of Sao Paulo/BR

Conclusio 1, CMF

Sustainable laboratories

Planning, controlling and operation*

14:00 **A universal science building? Challenging the over-customisation of design in laboratory planning**
M. Dockery, Sui Generis Ltd., Evesham/UK

14:30 **How to optimise operating costs in laboratory buildings? Latest results of a qualified benchmarking project**
A. Kuehne, Bauakademie – Gesellschaft für Forschung, Entwicklung und Bildung mbH, Berlin/D; U. Schönfelder, BASF SE, Ludwigshafen/D; F. Runge, Bauakademie – Gesellschaft für Forschung, Entwicklung und Bildung mbH, Berlin/D

15:00 **Analytics and real-time monitoring drives optimised integration of laboratory facilities and facilities operations**
J. Phillips, IBM Global Business Services, Newtown, PA/USA

15:30 **Using building automation system data to manage laboratory energy and operation**
J. Coogan, Siemens Industry Inc., Buffalo Grove, IL/USA

16:00 **Leveraging energy efficiency and demand reduction through the implementation of total lighting control and integration with building management systems**
T. Kehrli, Lutron Electronics Co. Inc., Coopersburg, PA/USA

16:30 **Specifying exhaust systems to avoid adverse health**
J. Carter, CPP Wind Engineering and Air Quality Consultants, Fort Collins, CO/USA

17:00

Conclusio 2, CMF

Mixing and separation technology

Distillation: design

10:30 **Design of FLNG (Floating Liquified Natural Gas) processing units with state of the art technology**
S. Shetti, Sulzer Chemtech Ltd., Winterthur/CH

11:00 **An integrated toolbox for process synthesis**
M. Wiedau, M. Soemers, M. Theißen, AixCAPE e.V., Aachen/D

11:30 **New features to boost the performances of the fractionation trays**
G. Mosca, S. Hirsch, Sulzer Chemtech Ltd., Winterthur/CH

12:00 **High capacity packing test data and influence of test system**
M. Wehrli, Sulzer Chemtech Ltd., Winterthur/CH

12:30 **Intensification and modelling of large-sized mass transfer equipment**
N. Kulov, Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow/RUS; Yu. Lebedev, OAO NPK «Kedr-89», Moscow/RUS

Fantasie 1, CMF

Advanced reaction engineering

Petrochemicals

Developing linear-alpha-olefins technology – from laboratory to a commercial plant
A. Meiswinkel, A. Wöhl, W. Müller, H. Bölt, Linde AG, Pullach/D

Advanced model for operational optimisation of steam crackers
A. Iliyas, M. Saudagar, Saudi Basic Industries Corporation, Riyadh/SAR; S. Spatenka, Z. Urban, C. Pantelides, Process Systems Enterprise, London/UK

Influence of washing solution's pH on the reduction of impurities in salt (NaCl) and the environment impact
B. Behzadi, Arvand Petrochemical Co., Mahshahr/IR

Kinetic study of isomerisation of n-octane
U. Raychaudhuri, A. Dhar, University of Calcutta/IND; D. Ghosh, Numaligahr Refinery Ltd./IND

Efficient technologies of organic synthesis under microwave radiation
S. Zlotsky, Ufa State Petroleum Technological University/RUS

Fantasie 2, CMF

Plant control

Advanced process control

Controlling brewers' yeast propagation process using a fuzzy logic-based expert system
S. Birle, M.A. Hussein, T. Becker, TU München/D

Carbon management in the hydrocarbon production arena
R. Calder, Invensys Operations Management, Crawely/UK; G. Fernholz, Invensys Operations Management, Neuss/D; H. Gulati, Invensys Operations Management, Lake Forest, CA/USA

An optimal control technique based on entropic modelling applied to the production of propylene glycol
H. Bispo, N. Silva, J. Manzi, Federal University of Campina Grande/BR

Theory of predictive control and application on distillation columns
R. Ait Ali Yahia, M. Smahi, Algerian Petroleum Institute, Boumerdes/DZ

Conclusio 2, CMF

Mixing and separation technology

Product design

14:00 **13.30 Plenary lecture**
cf. room Harmonie 3, CMF

14:30 **Crystallisation of bio molecules/plant-based products**
I. Koudous, S. Both, J. Strube, TU Clausthal/D

15:00 **Flow chemistry involving solids including crystallisation**
X. Ni, NiTech Solutions Ltd., Edinburgh/UK

15:30 **Production of highly purified substances via counter-current crystallisation**
E. Temmel, MPI for Dynamics of Complex Technical Systems, Magdeburg/D; U. Müller, HAPILA GmbH, Gera/D; D. Grawe, Jesalis Pharma GmbH, Jena/D; R. Eilers, HAPILA GmbH, Gera/D; H. Lorenz, A. Seidel-Morgenstern, MPI for Dynamics of Complex Technical Systems, Magdeburg/D

16:00 **Dispersion based on laminar elongational flow**
M. Sellerberg, S. Schlinge, A. Neumann, P. Walzel, TU Dortmund/D

16:30 **Direct experimental study of a phenomena of early drag crisis on a solid spherical particle in a strongly turbulent gas flow**
N. Simakov, Yaroslavl State Technical University/RUS; A. Simakov, Los Alamos National Laboratory, NM/USA

17:00

Fantasie 1, CMF

Advanced reaction engineering

Process intensification

Research agenda for process intensification
A. Stankiewicz, TU Delft/NL; A. Górak, TU Dortmund/D

Appliance of pervaporation in the methyl acetate synthesis
T. Winkler, S. Lux, M. Siebenhofer, TU Graz/A

Ultrasonically induced and enhanced phase transfer catalysis
K. Hielscher, Hielscher Ultrasonics GmbH, Teltow/D

Influence of ultrasound on the degradation of phenol by UV/TiO_2
W. Van de Moortel, Catholic University of Leuven/B; K. Sniegowski, Limburg Catholic University College, Diepenbeek/B; J. Degrève, Catholic University of Leuven/B; B. Vanderbeke, J. Luyten, Associated Faculty of Industrial and Biological Sciences, St-Katelijne-Waver/B

Continuous microwave irradiated reactor for fast biomass hydrolysis
L.A. Jermolovicius, R.B. do Nascimento, E.R. de Castro, J.T. Senise, Maua Institute of Technology, São Caetano do Sul/BR

High pressure batch microwave irradiated reactor for total biomass hydrolysis
L.A. Jermolovicius, R.B. do Nascimento, E.R. de Castro, J.T. Senise, Maua Institute of Technology, São Caetano do Sul/BR

Plasma-chemical reactor based on surface barrier discharge
V.V. Andreev, L.A. Vasilyeva, Chuvash State University, Cheboksary/RUS

Fantasie 2, CMF

Laboratory and analytical techniques

Lab engineering and processes

High-speed laboratory scale grinding down to the nanometer range
A. Theisen, RETSCH GmbH, Haan/D

Oxygen bomb calorimetry: application solutions demonstrated by a household waste sample
K. Linde, IKA-Werke GmbH & Co. KG, Staufen/D

Microfluidic calorimeters (based on thermopile chips) for biological and chemical applications
M. Jaegle, Fraunhofer IPM, Freiburg/D; J. Antes, Fraunhofer ICT, Pfinztal/D

Medical device/drug delivery devices sterilisation by irradiation: method comparison
P. Liger, Getinge-La Calhene, Villebon/F

Surface- and microanalysis using XPS, EDS/WDS and EBSD
J. Simon, Thermo Fisher Scientific GmbH, Dreieich/D

A new method of xenobiotics bioidentification in fresh water
V. Tonkopii, Russian Academy of Sciences, St. Petersburg/RUS

Development of reverse osmosis technique for treatment of highly contaminated municipal solid waste landfill leachate
R.S. Sapkal, SGB Amravati University/IND; V.R. Sapkal, A.N. Vaidya, National Environment Research Institute, Nagpur/IND

Illusion 1, CMF

Plant components

Optimisation and design of process and reactor

Significant reductions of investment and operating costs of apparatus using a new method for the design process
P.S. Ernst, G. Fieg, TU Hamburg-Harburg/D; F. Schlüter, V. Green, ENCOS Engineering & Construction, Hamburg/D

Development of package units for industrial processes
J. Rottke, TU Clausthal/D; D. Köster, ThyssenKrupp Uhde GmbH, Dortmund/D; J. Strube, TU Clausthal/D

Internal and external production logistics analysis: a framework for optimised process performance
T. Hellenkamp, INOSIM Consulting GmbH, Dortmund/D; P. Balling, INOSIM Software GmbH, Ammersbek/D

Optimisation of multiphase reactors by multiscale modelling
M. Schlüter, M. Bothe, TU Hamburg-Harburg/D; M. Grünewald, University of Bochum/D; H.R. Lausch, M. Becker, Evonik Industries AG, Marl/D

Numerical and experimental investigation of the influence of wall structures on the void fraction distribution in packed beds
T. Eppinger, N. Zobel, F. Behrendt, M. Kraume, TU Berlin/D

Illusion 2, CMF

CO_2 separation and utilisation

CO_2 capture

Newest innovations in high performance structured packings for specific applications
J. Rauber, Sulzer Chemtech Ltd., Winterthur/CH

Fully rigorous implementation of the Maxwell-Stefan diffusion model as part of a modern, phenomenological model platform: towards a fully predictive capability for model-based design of aq. Alkanolamine/Caustic Soda CO_2 removal processes
P. Lawrence, M. Nauta, Z. Urban, J.C. Mani, Process Systems Enterprise, London/UK

Recovery of CO_2 with innovative capture process from hydrogen production
H. Lyhne, P. Wiers, Union Engineering, Fredericia/DK

Exploring a new concept for CO_2 sequestration based on the flow of flue gas through mesopores by means of computer simulation
H. Morgner, University of Leipzig/D

Optimisation of preparation conditions for dry potassium-based sorbent for maximum CO_2 capture capacity at low temperature
J. Esmaili, M.R. Ehsani, TU Isfahan/IR

Illusion 3, CMF

ICOSSE – International Congress on Sustainability Science and Engineering*

Welcome and Introduction 10:30

10:40 Sustainability in the Chemical Industry
E. Koch, T. Pinkepank, P. Saling, BASF SE, Ludwigshafen/D

11:00

Environmental aspects of sustainability 11:30
H. Wenzel, University of Southern Denmark, Odense/DK

Value chain aspects of sustainability 12:00
A. Speck, Marks & Spencer, London/UK

Safety performance aspects of sustainability 12:30
S. Berger, AICHE – Center for Chemical Process Safety, New York, NY/USA

Illusion 1, CMF

Plant components

Heat exchangers

Total cost of ownership of plate heat exchangers
E. Kulenovic, Alfa Laval Lund AB/S; I. Lasson, Alfa Laval Tumba AB/S

Plate heat exchanger made of silicon carbide
S. Prietzel, F. Meschke, ESK Ceramics GmbH & Co. KG, Kempten/D

Development of a welded tantalum plate heat exchanger for acids at temperatures exceeding 200°C
S. Eriksen, Tantaline A/S, Nordborg/DK

Solving fouling problems in industrial applications via plate heat exchanger innovation
A. Bani Kananeh, J. Peschel, GEA Ecoflex GmbH, Sarstedt/D

Life cycle optimisation for plate heat exchangers
H. Knutson, Alfa Laval Lund AB/S

Distributed temperature sensing for coil wound heat exchangers in LNG application
M. Weikl, R. Flüggen, J. Ferstl, C. Richardt, Linde AG, Pullach/D

Illusion 2, CMF

CO_2 separation and utilisation

CO_2 utilisation

13.30 Plenary lecture
cf. room Harmonie 3, CMF

Keynote Lecture
Review of emerging industrial technologies around CO_2 recycling
E. Quadrelli, University of Lyon, Villeurbanne/F; G. Centi, S. Perathoner, University of Messina/I; J.L. Duplan, IFP Energies Nouvelles, Solaize/F

Carbon dioxide capture and utilisation in the green economy
P. Styring, K. Armstrong, S. Supasitmongkol, University of Sheffield/UK

Dream production – chemical utilisation of CO_2
M. Peters, A. Wolf, Bayer Technology Services GmbH, Leverkusen/D; C. Guertler, Bayer MaterialScience AG, Leverkusen/D; T.E. Mueller, W. Leitner, RWTH Aachen/D

Activation of carbon dioxide and its utilisation as a chemical resource
H. Vogt, W. Leitner, T.E. Müller, RWTH Aachen/D

CO_2-polymers – a new sustainable polymer class
M. Lehenmeier, S. Kissling, B. Rieger, TU München/D; P. Deglmann, A. Brym, BASF SE, Ludwighafen/D

Illusion 3, CMF

ICOSSE – International Congress on Sustainability Science and Engineering (continued)

Academic perspective and tools to measure and benchmarking 14:00
A. Azapagic, University of Manchester/UK

14:30

Social responsibility 15:00
J. Doumbia, World Bank, IMF, Washington, DC/USA

Innovation and sustainability 15:30
D. Cameron, Alberti Advisors, Plymouth, MN/USA

Product stewardship and sustainability 16:00
J. Powell, Shell Global Solutions, Houston TX/USA

AIChE, DECHEMA and the ICOSSE LABEL 16:30
J. Wispelwey, AIChE, New York, NY/USA, K. Wagemann, DECHEMA e.V., Frankfurt/D

Discussion of above, and announcement of Companies which earned the **International Certificate on Sustainable Standards for Engineering (ICOSSE)** at ACHEMA 17:00

* co-organised by AIChE, American Institute of Chemical Engineers, New York, NY/USA

Europa 1, Hall 4.0

Advanced fluids in process engineering

Properties and characterisation

10:30 **Using X-ray computed tomography and CFD simulations for the estimation and characterisation of relevant apparatus parameters**

I. Schmidt, M. Minceva, W. Arlt, University of Erlangen-Nuremberg/D

11:00 **Efficient parametrisation and thermodynamic properties of an ionic liquid via molecular dynamics simulation**

T. Köddermann, M. Huelsmann, K. Kirschner, D. Reith, Fraunhofer SCAI, Sankt Augustin/D

11:30 **Measurement of thermophysical properties in fluids at elevated pressures**

P. Jaeger, Eurotechnica GmbH, Bargteheide/D; A. Pietsch, Lübeck University of Applied Science/D; R. Eggers, TU Hamburg-Harburg/D

12:00 **Ionic liquids as thermal fluids revisited**

H. Sahin, T.J.S. Schubert, Iolitec GmbH, Heilbronn/D

12:30 **NOE NMR spectroscopy in the ionic liquid phase**

R. Giernoth, Y. Lingscheid, University of Cologne/D

Entente, Hall 4.C

Experience in advanced pharmaceutical technology*

Handling and filling of high potent drugs, continous production, PAT-applications, serialisation

Handhabung von hochaktiven Substanzen in der Pharmaindustrie

C. Panhans, M+W Process Industries GmbH, Nuremberg/D

Kontinuierliches Mischen und Granulieren

J. Thies, Gebrüder Lödige Maschinenbau GmbH, Paderborn/D

Fallstudie: Konzeption, Konstruktion, Lieferung und Qualifizierung einer Produktionslinie unter Isolator für Zytostatika in flüssiger oder gefriergetrockneter Form in Vials

J. Gemmecker, OPTIMA GROUP pharma GmbH, Schwäbisch Hall/D

Implementierung von Kennzeichnungs- und Verifizierungs-Systemen bei pharmazeutischen Herstellern

D. Sanwald, Robert Bosch GmbH, Waiblingen/D; J. Hessing, Wolke Ink., Sindelfingen/D

Integrated track & trace solution (filling the gap between shop floor and supply chain)

R. Blumenthal, Werum Software & Systems AG, Lüneburg/D

Alliance, Hall 4.C

Pharmaceutical production

Filling and containment

Simplified containment – the new way

E. Richardson, DEC Group, Ecublens/CH

Single-use systems for formulation and filling applications: considerations, technologies & solutions

B. Rawlings, Pall Corporation, Portsmouth/UK; H. Pora, Pall Corporation, Saint Germain-en-Laye/F

Closed vial technology, a new aseptic filling technology providing safer and easier solution to the pharmaceutical industry

B. Verjans, Aseptic Technologies, Gembloux/B

Design of a small scale fill and finish facility for clinical trials

A. Stromeck, NNE Pharmaplan GmbH, Bad Homburg/D

Case study – pilot scale OSD production line

J. Trapl, M+W Group GmbH, Stuttgart/D; S. VandeVondele, M+W Process Industries GmbH, Allschwil/CH

Europa 1, Hall 4.0

Advanced fluids in process engineering

Applications

14:00 **Thermomorphic solvent systems and their application to hydroformylation of higher olefins**

Y. Brunsch, A. Behr, TU Dortmund/D

14:30 **Selective hydrogenation of benzene to cyclohexene with dicyanamide based ionic liquids**

F. Schwab, M. Lucas, P. Claus, TU Darmstadt/D

15:00 **Breathable water-tight membranes prepared in liquid CO_2, for textile and leather applications**

L. Eng, A.M. Marcusson, J.A. Hamrefors, J. Karthäuser, SiOx Machines AB, Sollentuna/S

15:30 **Efficient transformation of sugar-derived biomass into platform chemicals using homo- and bimetallic nanocatalysts**

K. Yan, F. Qin, L. Orzechowski, N. Theyssen, MPI for Coal Research, Mülheim an der Ruhr/D; W. Leitner, RWTH Aachen/D

16:00 **Ionic liquid thin film technologies**

P. Wasserscheid, University of Erlangen-Nuremberg/D

16:30 **Brønsted acidic ionic liquids – application as catalysts and solvents in biphasic reactions**

K. Titze-Frech, P.S. Schulz, University of Erlangen-Nuremberg/D; N. Ignatiev, Merck KGaA, Darmstadt/D; P. Wasserscheid, University of Erlangen-Nuremberg/D

17:00 **Supercritical CO_2 as novel particle formation media: applications to the formation of metallic nanoparticles**

M. Türk, M. Crone, S. Müller, Karlsruhe Institute of Technology (KIT)/D

Entente, Hall 4.C

Experience in advanced pharmaceutical technology*

Handling and filling of high potent drugs, continous production, PAT-applications, serialisation

New developments in the formulation of parenteralia with highly active substances

D. Collins, Hermann Waldner GmbH & Co. KG, Wangen im Allgäu/D

Manufacturing science and technology for highly potent products – cleaning and inactivation processes in barrier systems

J. Rauschnabel, K. Lerch, Robert Bosch GmbH, Crailsheim/D

Requirements and trends on highly potent API and pharmaceutical production

R. Denk, HECHT Technologie GmbH, Pfaffenhofen/D

100% online and visual inspection system via x-ray

M. Beck, Bosch Packaging Technology, Waiblingen/D

Micronisation of active pharmaceutical ingredients (API)

S. Mende, NETZSCH-Feimahltechnik GmbH, Selb/D

Experiences with continuous granulation using a twin-screw extruder – a case study

D. Djuric, L.B. Bohle Maschinen und Verfahren GmbH, Ennigerloh/D

Choice of filter systems suitable for the containment – variants of filter systems with sintered lamellar filters

H. Adlhoch, Herding GmbH Filtertechnik, Amberg/D

*organised by VDMA German Engineering Federation, Food Processing and Packaging Machinery

Alliance, Hall 4.C

Pharmaceutical production

Apparatus and methods

Tandem Lecture

Innovative bulk freeze drying of lyophilized microspheres: process principles, technologies and product properties (I) / industrial application & case study of an integrated manufacturing line (II)

B. Luy, M. Plitzko, Meridion Technologies GmbH, Müllheim/D

Microwave vacuum and freeze drying

P. Pueschner, Pueschner GmbH + Co. KG, Schwanewede/D

Solvent based membrane nanofiltration for process intensification

H. Beckers, A. Buekenhoudt, R. Vleeschouwers, VITO, Mol/B

Controlled humidity drying in spray dryers and fluid beds

H. Schwartzbach, GEA Process Engineering A/S – GEA Niro, Soeborg/DK

European economic assessment of controlled atmosphere area in hospital pharmacies

B. Dekyndt, University of Lille 2/F; D. Meyer, Getinge Company, Paris/F; P. Odou, University of Lille 2/F

Solubility enhancement of poorly soluble drugs by cogrinding in the micros

S. Watano, Nara Machinery Co., Ltd., Tokyo/J

Logos/Genius, Hall 9.1

Bioprocesses

(Bio)chromatography

Concentration and purification of a baculovirus by ion exchange membrane chromatography
T. Grein, Giessen University of Applied Sciences/D; R. Michalsky, Kansas State University, Manhattan, KS/USA; M. Vega López, P. Czermak, Giessen University of Applied Sciences/D

Spatial homogeneity analysis of packed bed chromatography
E. von Lieres, A. Püttmann, S. Schnittert, B. Stute, Forschungszentrum Jülich GmbH/D

Mixed mode chromatography for protein separations: application to intermediate step in monoclonal antibody purification following capture using protein A
S. Bengio, M. Toueille, Pall Life Sciences, Cergy-Saint-Christophe/F; D. Sievers, Pall Life Sciences, Dreieich/D

Purification of HSA from blood serum by SMB
F. Sander, M. Fuchs, M. Luebbert, M. Naether, Wissenschaftliche Gerätebau Dr. Ing. Herbert Knauer GmbH, Berlin/D

From batch to continuous: multi column chromatography in biotechnology
C. Helling, J. Strube, TU Clausthal/D

Esprit, Hall 9.1

Bioprocesses

Bio-based production

Keynote Lecture
Reaction engineering of solvent-free biotransformations – from g to kg scale
A. Liese, TU Hamburg-Harburg/D

Bio-based production of organic acids in *C. glutamicum*: process development and optimisation
K. Kinast, T. Olfers, B. Litsanov, M. Bott, W. Wiechert, M. Oldiges, Forschungszentrum Jülich GmbH/D

Glucose recovery in ionic liquid assisted processing of wooden biomass via nanofiltration
C. Abels, A. Böcking, T. Melin, M. Wessling, RWTH Aachen/D

Optimal operation policy of a bioethanol production process
K. Brito, B. Araujo, Federal University of Campina Grande/BR

Dialog, Hall 9.2

Biorefineries and processing of renewables

Platform chemicals

10:30 **Pilot plant facility for the scale-up of continuous mode lactic acid fermentation**
J. Venus, Leibniz Institute for Agricultural Engineering Potsdam-Bornim e.V./D

11:00 **Optimisation of electro-dialysis with bipolar membranes (EDBM) for the production of itaconic acid**
J. Stodollick, S. Abdu, M. Gloede, M. Wessling, T. Melin, RWTH Aachen/D

11:30 **The new multipurpose Biotech facility in Leuna: producing organic acids without disposing byproducts**
J. Schulze, ThyssenKrupp Uhde GmbH, Leipzig/D

12:00 **Selective dehydration of biogenic lactic acid to acrylic acid**
G. Näfe, Y. Traa, Th. Hirth, E. Klemm, University of Stuttart/D

12:30 **Using bio-fuel byproducts as substrate for the biotransformation of glycerol: benefits for the production of 3-hydroxypropionaldehyde by *Lactobacillus reuteri***
S. Oehmke, A.-P. Zeng, TU Hamburg-Harburg/D

Logos/Genius, Hall 9.1

Bioprocesses

Measurement and modelling

New on-line respiration technology for monitoring and controlling bioprocesses
W. Genthe, LAR Process Analysers AG, Berlin/D

Optimising fermentation control with optical cell growth sensors
M. Weiß, A. Krump, J. Nentwich, T. Steckenreiter, Endress+Hauser Conducta GmbH & Co. KG, Gerlingen/D

Engineering analysis of mixing process in single-use cubical bioreactors using computational fluid dynamics
A. Farouk, F. Moncaubeig, ATMI, Hoegaarden/B

The production of bio-ethanol in large-scale fermenters: study of complex mixing phenomena
H. Zhang, J. Baeyens, T. Tan, Beijing University of Chemical Technology/PRC

Model based optimisation of biomethane plants
P. Biernacki, S. Steinigeweg, A. Borchert, E. Siefert, F. Uhlenhut, I. Stein, Emden/Leer University of Applied Science/D; M. Wichern, University of Bochum/D

Simulation of complex microfluidics for biotechnology applications
S. Schmidt, A. Latz, Fraunhofer ITWM, Kaiserslautern/D

Esprit, Hall 9.1

Bioprocesses

Environmental biotechnology

Economical and ecological treatment of fermentation residues from anaerobic biogas plants
P. Messerli, H. Bättig, VP-Hottinger AG, Spreitenbach/CH

Biological control of industrial VOC emissions
C. Dressler, Lenzing Technik GmbH/A

An electro-enzymatic denitrification system
Y. Yoo, Seoul National University/ROK

New toxicity measurement technology for protection of bioreactors – especially anaerobic bioreactors
W. Genthe, LAR Process Analysers AG, Berlin/D

Intensification of the anaerobic digestion of waste activated sludge by microwave pretreatment
L. Appels, S. Houtmeyers, M. Daled, J. Van Impe, R. Dewil, Catholic University of Leuven/B

Performance improvement of treatment process for waste water using submersible membrane bio-reactor
R. Sapkal, Sant Gadgebaba Amravati University/IND; P. Sapkal, Institute of Chemical Technology, Mumbai/IND; S. Kakde, Sant Gadgebaba Amravati University/IND; D. Garkal, Department of Chemical Engineering, Pune/IND; V. Sapkal, National Institute of Technology, Surat/IND

Enhancing the bio-degradability of waste water/ pollutants by a high degree, using pre-ozonation with a novel method with on-line in-situ ozone reactors
S. Ananthi, University of Madras, Chennai/IND; P.M. Alex, Kansas State University, Manhattan, KS/USA; K. Padmanabhan, Anna University, Chennai/IND

Dialog, Hall 9.2

Biorefineries and processing of renewables

Alternative feedstocks and processes

14:00 **Liquebeet as alternative fermentation substrate**
J. Gerlach, A. Koltermann, Süd-Chemie AG, Munich/D

14:30 **Biorefining algae, the potential and challenges**
P.J.T. Bussmann, G.A.H. de Jong, F. Boon, TNO, Zeist/NL

15:00 **Hydrolysis of cellulose in sub- and supercritical water. Experimental results, modelling and reactor optimisation**
D.A. Cantero, M.D. Bermejo, M.J. Cocero, University of Valladolid/E

15:30 **Enzymes by design for designer bugs**
M. Struhalla, c-LEcta GmbH, Leipzig/D

16:00 **High-pressure processes for the production and loading of cellulose aerogels as highly porous material and drug delivery agents**
M. Wendland, E. Haimer, University of Natural Resources and Life Sciences, Vienna/A; C. Schimper, A. Potthast, T. Rosenau, F. Liebner, University of Natural Resources and Life Sciences, Tulln/A

16:30 **Regional survey on biogenic residues from the food and biotech industry**
B. Gaida, Bremen University of Applied Sciences/D; I. Schüttmann, University of Giessen/D; B. Mahro, Bremen University of Applied Sciences/D; H. Zorn, University of Giessen/D

17:00 **Feedstock-agnostic direct fermentation to isobutene, propylene butadiene and other light olefins**
T. Buhl, Global Bioenergies S.A., Munich/D; M. Delcourt, Global Bioenergies S.A., Evry/F

Harmonie 1, CMF

Energy efficiency by integrated processes

Environmental applications

10:30 **Large-scale realisation of an anaerobic membrane bioreactor for high-load digestion of urban sewage sludge**
A. Ante, W. Gebicke, P. Börgardts, Eisenmann Anlagenbau AG GmbH & Co. KG, Holzgerlingen/D; M. Mohr, T. Zech, W. Sternad, U. Schliessmann, Fraunhofer IGB, Stuttgart/D

11:00 **Increasing energy efficiency of biowaste composting by novel processing techniques**
N. Bauerschlag, S. Kaufeld, Th. Pretz, RWTH Aachen/D

11:30 **Anaerobic treatment of chemical wastewaters – new technologies bring new opportunities**
J. Van Geest, D. Korthout, J.H.F. Pereboom, Biothane, Delft/NL

12:00

12:30

Harmonie 2, CMF

Safety

Devices and systems

Is a pressure relief system a very reliable safety measure?
E. Molter, V. Stellmacher, Bayer Technology Services GmbH, Leverkusen/D

Higher flow capacity with API piping configuration buckling pin relief valve
J. Kelly, BS&B Safety Systems Limited, Limerick/IRL; G. Brazier, BS&B Safety Systems, LLC, Tulsa, OK/USA

Influence of particles on venting of foaming systems
H. Imhof, J. Steinbach, TU Berlin/D

Rupture disk integrity sensing leads to increased reliability of pressure relief systems
G. Brazier, BS&B Safety Systems, LLC, Tulsa, OK/USA

Fatigue of material due to noise induced vibrations in chemical and petrochemical plants
H. Posselt, A. Biegner, Linde Engineering, Pullach/D

Harmonie 3, CMF

Chemical nanotechnology

Ionic liquids as novel dispersing agents for nanoparticles: Easy- and safe-to-handle dispersions for energy applications
F.S. Stiemke, T.J.S. Schubert, Iolitec GmbH, Heilbronn/D

Nanoparticle growth studies as essential step to improve synthetic procedures
J. Polte, M. Wuithschick, TU Berlin/D; K. Rademann, Humboldt University of Berlin/D; F. Emmerling, R. Kraehnert, BAM Federal Institute for Materials Research and Testing, Berlin/D

Template-assisted electrostatic spray deposition as a new route to mesoporous, macroporous and hierarchically porous oxide films
S. Sokolov, Leibniz Institute for Catalysis (LIKAT), Rostock/D; B. Paul, E. Ortel, R. Kraehnert, TU Berlin/D

Nanoparticles as functional additives in meltspun filament yarns
J. Wulfhorst, W. Steinmann, G. Seide, T. Gries, M. Heidelmann, T. Weirich, RWTH Aachen/D

Silver nanowires – control of size, shape and aspect ratio and their application in transparent and conductive thin film electrodes
O. Zech, H. Krüger, G. Maier, R. Nusko, ras materials GmbH, Regensburg/D

Harmonie 1, CMF

Chemical leasing

14:00 **Global chemical leasing projects and strategies to support resource efficiency and green chemistry**
P. Schwager, UNIDO, Wien/A

14:30 **Practical implementation of chemical leasing and synergies with sustainable chemicals management**
R. Joas, BiPRO GmbH, München/D

15:00 **Results obtained by implementation of a chemical leasing business model on bonding of boxes**
V. Satric, Centre for Cleaner Production of Serbia, Belgrade/YU; D. Odadzic, Henkel Srbija d.o.o., Belgrade/YU

15:30 **First steps towards the implementation of chemical leasing in Brazil**
A. Oestreich, Technological Center for the Environment of the Industrial Chamber of Rio de Janeiro State, Rio de Janeiro/BR

16:00 **Chemical leasing of solvents – a sustainable approach for metal cleaning**
L. Willms, S. Saecker, SAFECHEM Europe GmbH, Düsseldorf/D

16:30 **Chemical leasing – a contribution to sustainable chemistry? Project examples from medical hygiene, printing and wood industry**
M. Hempel, Deutsche Bundesstiftung Umwelt, Osnabrück/D

17:00 **The German chemical leasing initiative – a contribution to sustainable chemistry**
C. Blum, S. Walter-Rohde, German Federal Environment Agency, Dessau-Roßlau/D

17:30 Global Chemical Leasing Award 2012 Ceremony

Harmonie 2, CMF

Safety

Devices and systems (continued)

Device selection for safety instrumented systems: process or machinery safety? What to consider for the operator of production plants in process industry?
G. Klotz-Engmann, R. Wenige, Endress+Hauser Messtechnik GmbH & Co. KG, Weil am Rhein/D

Investigation of common application failures on storage tanks proven by life field testing of endurance burning tested end-of-line flame arresters
M. Davies, T. Heidermann, Braunschweiger Flammenfilter GmbH/D

Keeping critical safety systems up-to-date
T. Kirchrath, Invensys Systems GmbH, Neuss/D

Assessment of mechanical final elements used in safety related systems according to IEC 61508 and IEC 61511
T. Kueppers, TÜV Rheinland Energie und Umwelt GmbH, Cologne/D

Safety devices and services for boiler automation control systems
R. Posta, GESTRA AG, Bremen/D

Tank safety showers: A (+)plus for safety in industrial applications
T. Geier, FSP-Tech GmbH, Essen/D

Eye wash solutions – the consequent first aid solution for both eyes
M. Jessulat, Plum Deutschland GmbH, Cuxhaven/D

Harmonie 3, CMF

Energy storage, transport and use

Thermal energy storage

Keynote Lecture
Thermal energy storage – key technology for sustainable development
R. Tamme, German Aerospace Center (DLR), Stuttgart/D

Thermochemical storage of heat
M. Linder, A. Wörner, German Aerospace Center (DLR), Stuttgart/D

Long term chemical heat storage for integrated energy networks
A. Becker, D.W. Agar, TU Dortmund/D

Zeolite/salt composite materials as thermo-chemical energy storage for solar thermal heating of buildings
H. Kerskes, B. Mette, H. Drück, University of Stuttgart/D; R. Gläser, University of Leipzig/D; A. Möller, INC, Leipzig/D

Harmonie 4, CMF

Mixing and separation technology

Distillation: modelling and control

Uncovering significant energy efficiencies with cyclic distillation through process intensification: Exploiting latest advances in modelling technology
P. Lawrence, Process Systems Enterprise, London/UK; V.N. Maleta, Maleta Cyclic Distillation, Jagotin/UA; J.C. Mani, Process Systems Enterprise, London/UK

Approaches to optimal operation schemes of batch distillation processes in chemical industry
M. Wendt, M. Strack, G. Hofmann-Jovic, Infraserv GmbH & Co. Knapsack KG, Hürth/D

Prediction of separation characteristics of multicomponent mixtures based on real components providing energy efficient distillation processes
P. Mair-Zelenka, T. Wallek, A. Reiter, M. Siebenhofer, TU Graz/A

Rate-based modelling and simulation of distillation columns filled with sandwich packings
Ö. Yildirim, U. Brinkmann, E.Y. Kenig, University of Paderborn/D

Dynamics and control of high purity extractive distillation using a single column
B.P. Guede, W.B. Ramos, M.F. Figueirêdo, R.P. Brito, Federal University of Campina Grande/BR

Harmonie 4, CMF

Mixing and separation technology

Filtration apparatus and processes

Process intensification of continuous or batchwise process streams with the dynamic cross-flow filter
G. Grim, ANDRITZ KMPT GmbH, Vierkirchen/D

Pushing the limits – how to continue the success story of rotary pressure filtration
D. Steidl, BHS-Sonthofen GmbH/D

Magnetic separation of particles from lubricating and hydraulic oils with an open gradient magnetic separator
A. Vetter, S. Ripperger, TU Kaiserslautern/D

Numerical and experimental investigation of the separation of suspension flows inside conical disc stack separators
E. Böndel, Mahle Industriefiltration GmbH, Öhringen/D; H. Sauter, Mahle Filtersysteme GmbH, Stuttgart/D; M. Piesche, University of Stuttgart/D

Requirements to eliminate gel particles in different processes
K. Brandt, Lenzing Technik GmbH/A

Hot gas filtration
S. Heidenreich, M. Salinger, Pall Filtersystems GmbH, Crailsheim/D

Diafiltration of concentrated suspensions with finest particles
D. Goldnik, S. Ripperger, TU Kaiserslautern/D

Spektrum, CMF

Process analytics*

Life science

Multi-sensor array for online monitoring using multivariate prediction and swarm intelligence
D. Krause, M.A. Hussein, T. Becker, TU München/D

Atline/online/inline solutions for quality and process control in the food industry
R. Sachse, Carl Zeiss MicroImaging GmbH, Jena/D

Design and field application of an optical fiber biofilm sensor
M. Fischer, M. Wahl, Leibniz-Institut für Meereswissenschaften (IFM-GEOMAR), Kiel/D; G. Friedrichs, University of Kiel/D

Towards a better understanding of coating processes – in- and off-line monitoring using Raman spectroscopy as a PAT tool
M. Wirges, D. Brock, University of Düsseldorf/D; A. Funke, P. Serno, Bayer Pharma AG, Berlin/D; K. Knop, P. Kleinebudde, University of Düsseldorf/D

Quality by design: mastering your bioprocess through whole process analysis
J.E. Machado, 4Tune Engineering Ltd., Lisbon/P; J.C. Menezes, Technical University of Lisbon/P; J. von Frese, Data Analysis Solutions DA-SOL GmbH, Utting am Ammersee/D

Spektrum, CMF

International powder and nanotechnology forum**

Pharmaceuticals, crystallization, microreactors

13:00
Welcome and introduction
Y. Kawashima, Aichi Gakuin University/J

13:30
Design of polymer materials using microreactors
T. Ono, Okayama University/J

14:00
Micoreactors and their three intensification fields – from fine chemistry to particle making
V. Hessel, TU Eindhoven/NL

14:30
Crystal quality control by using modulated operation of solution supersaturation
H. Takiyama, Tokyo University of Agriculture and Technology/J

15:00
New approaches to form coated tablets, pellets or granules for pharmaceutical-, agro- or chemical industries
J. Ulrich, University of Halle-Wittenberg/D

15:30
Recent advances in dosage form design based on particle engineering
H. Takeuchi, Gifu Pharmaceutical University/J

16:00
Recent developments in granulation with special focus on roller compaction
K. J. Steffens, University of Bonn/D

16:30
Particle design for oral absorption of sparingly water soluble drug with porous material prepared by supercritical fluid system
K. Terada, Toho University/J

* Co-organised by joint working party of GDCh and DECHEMA „Process Analytical Technology"

** organised by Committee IPTF2012

Conclusio 1, CMF

Sustainable laboratories

Ventilation, energy and economy*

10:30 **Laboratory room control requirements in the course of time**
B. Schoeler, WALDNER Laboreinrichtungen GmbH & Co. KG, Wangen/D

11:00 **Air management – an integral design will enhance economy, efficiency, safety and flexibility**
M. Olders, TROX GmbH, Neukirchen-Vluyn/D

11:30 **Applying phase change materials in sustainable laboratories**
P. Dockx, Van Looy Group, Antwerp/B

12:00 **Clean room HVAC optimisation**
T. Riffel, T. Walsh, Siemens Schweiz AG, Zug/CH

12:30 **A holistic overview of technologies and strategies to achieve near net zero labs**
G. Sharp, Aircuity Inc., Newton, MA/USA

Conclusio 1, CMF

Sustainable laboratories

Furnishing*

14:00 **Laboratory furniture goes green. How sustainable could/should laboratory furniture be?**
K. Kreuzer, EGNATON e.V., Bensheim/D

14:30 **Sustainable materials for laboratories**
I. Aldamiz, Burdinola S. Coop., Amoroto/E

15:00 **Safety aspects of surfaces**
G. Ehmen, EhmTec Consulting GmbH, Bülach/CH

15:30 **Sustainability through global approved safety storage cabinets**
R. Bieder, Dueperthal Sicherheitstechnik, Karlstein/D

16:00 **Modular laboratory room systems**
C. Kern, WALDNER Laboreinrichtungen GmbH & Co. KG, Wangen/D

16:30 **Planning of economic laboratory furniture**
C. Roux, Köttermann SAS, St. Quentin Fallavier/F

17:00 **Laboratories – a statistical review**
V. Krieger, Burdinola Deutschland GmbH, Freiburg/D

* in cooperation with EGNATON e.V./D

Conclusio 2, CMF

High performance energy efficient heat exchangers and their rigorous modelling through process simulators

Course

10:30

Why You Should Attend

By attending the course you will learn the following topics that can add to your process industry knowledge.

- Practical knowledge about high performance compact heat exchangers, and their advantages and limitations

11:00

- Understanding key modelling aspects of complex high performance heat exchangers
- Benefits of rigorous exchanger modelling through process simulators to maximise the process performance

Introduction and Course Description

11:30

In order to realise the full energy saving potential of high performance heat exchangers within process plants, two things are essential – (1) to model them rigorously and (2) to model them in conjunction with other process equipment. Without rigorous modelling of the complex heat exchanger geometry, full benefits of exchanger performance cannot be realised.

12:00

The necessity of modelling the exchangers in their process environment is all the more clear. Without understanding the interaction of the exchanger with other process equipments how can exchanger design and operation be optimised to maximise the process performance? The problem in the past was lack of commercially available tools to carry out such detailed simulation. In this course you will learn how it is now possible to carry out rigorous simulation of high performance heat exchangers right inside a process flow sheet using process simulation software, integrated with detailed exchanger modelling.

12:30

Fantasie 1, CMF

Advanced reaction engineering

Particle technology

Application of innovative pelletizing technologies for the preparation of pellets and micropellets

A. Grave, N. Poellinger, L. Deck, F. Gerber, Glatt GmbH, Binzen/D

Continuous processing of granular materials

H.K. Staffin, R. Archibald, Procedyne Corp., New Brunswick, NJ/USA

Nanoparticles formation and thin film deposition by using the Laser Ablation System

S. Nagare, Nara Machinery Co., Ltd., Tokyo/J

CFD methods for nanoparticle synthesis in turbulent reacting flow

J. Akroyd, Computational Modelling Cambridge Ltd./UK; M. Kraft, University of Cambridge/UK

Fantasie 2, CMF

Plant control

Sensors and actuators

Wireless temperature measuring system with ATEX approval and electronic modules up to 125°C

M. Braun, JUMO GmbH & Co. KG, Fulda/D

Innovative multiparameter controller for water treatment applications

D. Berger, M. Rummer, ProMinent Dosiertechnik GmbH, Heidelberg/D

Measurement of dissolved hydrogen in biogas plants

M. Schelter, J. Zosel, W. Oelßner, U. Guth, M. Mertig, Meinsberg Kurt-Schwabe Research Institute, Ziegra-Knobelsdorf/D

The Scottish Sensor Systems Centre (SSSC): from measured data to useful information

J. Kiefer, N.C. Renton, R.D. Neilson, University of Aberdeen/UK

Conclusio 2, CMF

High performance energy efficient heat exchangers and their rigorous modelling through process simulators

Course

14:00

The course begins with classification of exchangers based on the degree of compactness and then it focuses on plate and plate-fin heat exchangers, and their design and simulation aspects. Design and simulation exploration for a plate-fin case is carried out using the most rigorous model available for simulation of plate-fin heat exchangers within the HYSYS

14:30

process simulator. High performance heat exchange can also be achieved by employing heat transfer enhancement technology within conventional exchangers. Because heat transfer enhancement is a topic by itself, the course focuses on only few illustrative practical examples of benefits of enhanced heat transfer.

15:00

Guest lecturers will highlight specific aspects of heat exchanger modelling within the context of process simulation. They will also illustrate specific process benefits, in terms of energy and operating cost savings, obtained by rigorous modelling of process heat exchangers

15:30

Who Should Attend?

Practicing process industry professionals, who are either new to the subject area or want to expand their heat transfer knowledge.

16:00

Course Registration

There is no course registration fee but you are strongly recommended to register for the course, http://achema.de/course. The registered participants will be sent the course timetable which will provide detailed breakdown of the topics covered in the course. Please contact the course leader on Vishwas.Wadekar@Aspentech.com if you need further information.

16:30

Course Leader

Dr. Vishwas Wadekar is Technology Director of HTFS Research at Aspen Technology Ltd, UK. He chairs the Aspen HTFS Industrial Review Panel on Compact Heat Exchangers and has been working with industrial heat transfer for nearly 30 years, specializing in compact exchangers and enhanced heat transfer. He is a chemical engineering graduate of Mumbai University, with a PhD in mass transfer.

17:00

Fantasie 1, CMF

Advanced reaction engineering

Polyreactions

Breakthrough for polyolefin R&D and QC

R. Gueller, Chemspeed Technologies AG, Augst/CH

Model-based scale-up in HDPE processes: from lab-scale experimentation to commercial plants

Z. Urban, C.C. Pantelides, Process Systems Enterprise Ltd., London/UK

Industrial polymer production: sustainable economy of scale

B. Stützle, LIST AG, Arisdorf/CH

CoPIRIDE: new technical expertise relating to the living anionic polymerisation of styrene

S. Schulze, University of Stuttgart/D; M. Schwarz, J. Lang, Evonik Industries, Essen/D; E. Klemm, University of Stuttgart/D

German scientific network "Campus bubble columns"

M. Becker, Evonik Industries AG, Marl/D; H. R. Lausch, Evonik Industries AG, Hanau/D; M. Bothe, M. Schlüter, TU Hamburg-Harburg/D; M. Grünewald, Ruhr-Universität Bochum/D

Performance of (PES) ultra filtration membranes casting at different temperature

P. Bansod, University of Amaravati/IND; V.S. Sapkal, University of Nagpur/IND

Fantasie 2, CMF

Managing corrosion with Teflon®*

13:30 Welcome and introduction
I. Fletscher, M. Brueck, DuPont International Sàrl, Geneva/CH

14:00 Dupont as an end-user of fluoropolymers
P. Khaladkar, DuPont Engineering, Wilmington, DE/USA

Preventing corrosion and managing diffusion with Teflon®

L. Bernard, SGL Carbon S.A.S., Saint Martin d'Hères/F

Fluoropolymer lined ball valve – design breakthrough presentation

D. Palmer, CRANE ChemPharma FlowSolutions & Energy Flow Solutions, Cincinatti, OH/USA

Experience in chemical plants with Teflon® fluoropolymer hoses and piping

B. Rijpkema, AkzoNobel Engineering & Operational Solutions, Arnhem/NL

Fluoropolymer coatings in harsh environments

N. Christensen, H.G. Brouzes, Accoat A/S, Kvistgaard/DK; J. Moisan, Total, Donges/F

Design and operational considerations for fluoropolymer lined steel constructions

M. Schlipf, Burgkirchen/D

Influence of high performance perfluoroelastomer sealing parts and composite wear parts on process reliability and total system cost
G. Lewis, Segment Leader, Energy & Material Handling Industry, EMEA, DuPont™ Kalrez® & Vespel® Business, DuPont UK Ltd., Stevenage/UK

17:30 Corrosion resistant materials of construction for various heat exchange technology solutions
H. Graepel, Wallstein Ingenieur GmbH, Recklinghausen/D

* organised by Du Pont de Nemours International SA, Le Grand-Saconnex/CH

Illusion 1, CMF

Plant components

Pipes & pumps

Flow of fluids – through valves, pipes, and fittings
G. Bach, CRANE ChemPharma Flow Solutions, Lindau/D

FRP piping response to dynamic load conditions
N. Bos, Dynaflow Research Group, Zoetermeer/NL

Design and implementation of an active vibration absorber for vibration reduction of piping systems in chemical plants
J. Engelhardt, Wölfel Beratende Ingenieure GmbH & Co. KG, Höchberg/D

Compressor revamps & remote diagnostic systems
O. Mahros, Siemens AG, Duisburg/D

Increased energy efficiency and cost savings through intelligently delivered chemical processes
M. Lebkücher, KSB AG, Pegnitz/D; M. Emde, KSB AG, Frankenthal/D

Illusion 2, CMF

CO_2 separation and utilisation

CCU – novel approaches

Electrochemical CO_2 activation in a microreactor
A. Inan, University of Stuttgart/D; N. Wagner, DLR Stuttgart/D; T. Dietrich, mikroglas chemtech GmbH, Mainz/D; E. Klemm, University of Stuttgart/D

Novel catalysts and catalytic systems for the synthesis of poly- and cyclic carbonates from carbon dioxide and epoxides
T. Werner, Leibniz Institute for Catalysis, Rostock/D

Mitigation of global warming by biological sequestration of CO_2 emission
A. Chakrabarty, S. Basu, S. Das, Institute of Genetic Engineering (IGE), Kolkata/IND; S.M. Ghosh, Sun Plant Agro Ltd., Kolkata/IND

Catalytic hydrogenation of carbon dioxide as the key process in continuous CO_2 recycle: synthesis of catalyst, optimisation of operating parameters and kinetic modelling
M. Sohrabi, S.J. Royaee, A. Shabani, Amirkabir University of Technology, Tehran/IR

CO_2 purification process for oxyfuel
F. Winkler, Linde AG, Pullach/D

Illusion 3, CMF

Perspectives 2012 – chemical and pharmaceutical production in Germany*

Key success factors for Germany's competitive edge

10:30 **The future of value creation in the German chemical and pharmaceutical industry**
U. Jung, The Boston Consulting Group, Frankfurt/D

11:00 **Study results: future of chemical and pharmaceutical industry in Germany**
M. Mau, Provadis School of International Management and Technology, Frankfurt/D

11:30 **Global trends facilitate industry consolidation in Europe**
M. Schmitz, Bergmann zur Hausen & Cie. GmbH, Frankfurt/D

12:00 **The role of chemical and industrial parks in attracting FDI**
J. Waldi, Chemical Industry Council (VCI) e.V., Frankfurt/D

12:30 **Panel Discussion**
Agenda 2015: framework for securing Germany's competitive edge
U. Jung, The Boston Consulting Group, Frankfurt/D; M. Mau, Provadis School of International Management and Technology, Frankfurt/D; M. Schmitz, Bergmann zur Hausen & Cie. GmbH, Frankfurt/D; J. Waldi, Chemical Industry Council (VCI) e.V., Frankfurt/D; J. Vormann, Infraserv GmbH & Co. Höchst KG, Frankfurt/D; *Host:* M. Reubold, CHEManager Europe, Weinheim/D

Illusion 1, CMF

Microreaction engineering

Online determination of reaction progress in microfluidic systems
J. Fagaschewski, S. Bohne, D. Sellin, J. Müller, L. Hilterhaus, TU Hamburg-Harburg/D

Scalability of microstructured devices: experimental mixing time determination in micro-mixers
K.D. Rodermund, M. Schuster, M. Grünewald, University of Bochum/D; F. Schael, J. Heck, Ehrfeld Mikrotechnik BTS GmbH, Wendelsheim/D

Mass transfer and fluid dynamic characterisation in micro process engineering at the example of a multi stage extraction system
C. Helling, J. Strube, TU Clausthal/D

A microfluidic method to assess demulsification kinetics for oil-water separation
T. Krebs, K. Schroen, R. Boom, Wageningen University/NL

Studies on solution polymerisation of polyacrylates in a microreactor applying an inline temperature measurement method
N. Entesari, C. Hecht, M. Grünewald, University of Bochum/D

Partial oxidation of o-xylene to phthalic anhydride inside of the explosion regime using a micro structured reactor
T. Lange, University of Stuttgart/D; S. Heinrich, C. Liebner, H. Hieronymus, BAM Federal Institute for Materials Research and Testing, Berlin/D; E. Klemm, University of Stuttgart/D

Synthesis methods that enable a rational design of catalytic coatings
E. Ortel, B. Eckhardt, D. Bernsmeier, R. Kraehnert, TU Berlin/D

Illusion 2, CMF

Resource productivity & energy in the chemical industry*

Chemical industry and environment – from environmental protection to resource productivity
M. Prox, ifu Hamburg GmbH/D

Efficiency and environmental protection – strategic recommendations for the chemical industry
N. Thißen, Bayer Technology Services GmbH, Leverkusen/D

Productivity in integrated production networks
M. Auer, Wentorf/D

Efficiency engineering by flow visualisation
M. Schottler, Verfahrenstechnische Beratung Martin Schottler, Stuttgart/D

Efficiency and environmental protection in engineering projects in chemistry
N.N.

Integrated resource efficiency analysis for climate impact reduction of chemical production sites
T. Viere, ifu Hamburg GmbH/D

Innovation and sustainability – environmentally-friendly product development in the chemical industry
N.N.

* organised by ifu Hamburg GmbH/D

Illusion 3, CMF

Perspectives 2012 – chemical and pharmaceutical production in Germany*

Managing site readiness

14:00 **Sustainable success in the chemical industry**
U. Ott, Clariant SE, Sulzbach/D

14:30 **The centennial TIGER relocation project**
A. Rockmann, Celanese Chemicals Europe GmbH, Frankfurt/D

15:00 **A site managers perspective on current and future realities**
R. Mohr, Infraserv GmbH & Co. Höchst KG, Frankfurt/D

15:30 **Preparation is key to future site readiness**
T. Henzelmann, Roland Berger Strategy Consultants GmbH, Munich/D

16:00 **Panel Discussion**
Agenda 2015: Managing site readiness
U. Ott, Clariant SE, Sulzbach/D
A. Rockmann, Celanese Chemicals Europe GmbH, Frankfurt/D
R. Mohr, Infraserv GmbH & Co. Höchst KG, Frankfurt/D
T. Henzelmann, Roland Berger Strategy Consultants GmbH, Munich/D
Host: M. Reubold, CHEManager Europe, Weinheim/D

16:30

17:00

* organised by Infraserv GmbH & Co. Höchst KG, Frankfurt/D

Consens, Hall 4.C

Water for industrial use

Process and waste water treatment

10:30 **New technology for fast and reliable monitoring of potable and ultra pure water generation**
W. Arts, LAR Process Analysers AG, Berlin/D

11:00 **Water for chromatography – more than a consumable**
A. Nordsiek, Millipore GmbH, Schwalbach/D

11:30 **Sustainable water disinfection: usage of full metallic catalysts for cooling water treatment**
P. Guttmann, Veolia Water Solutions & Technologies Deutschland GmbH, Celle/D; J.R. Koppe, MOL Katalysatortechnik GmbH, Schkopau/D

12:00 **New methods of boiler and process water microfiltration form an economical alternative to replace traditional sand filters**
S. Strasser, Lenzing Technik GmbH, Lenzing/A

12:30 **A new natural technology to purify water and recover commodities**
N. Strieder, GEA Wiegand GmbH, Ettlingen/D; S. Shelley, Creative Water Technology Ltd., Melbourne/AUS

Entente, Hall 4.C

E-learning

Optimising safety instruction by using E-learning
M. Öttl, Infraserv GmbH & Co. Höchst KG, Frankfurt am Main/D

The new thermal safety tutorial of the ESCIS
K. Schwenzfeuer, F. Hoffmann-La Roche AG, Basel/CH; R.J. Ott, ESCIS Publikationen, Meggen/CH

Best practise/example out of industry: Technical training online – experiences during implementation of a technical basic training online for employees of an international organisation
H. Maas, Endress+Hauser Messtechnik GmbH & Co. KG, Weil am Rhein/D

Using virtual reality for operator training – providing a full action & reaction mechanism to the entire plant crew
N. Jung, Invensys Operations Management, Neuss/D; P. Richmond, Invensys Operations Management, Manchester/UK

MES meets eLearning
M. Daegling, NNE Pharmaplan GmbH, Bad Homburg/D

Alliance, Hall 4.C

Pharmaceutical production

Development of pharmaceuticals

Intelligent compatibility screening for accelerated development
U. Bock, E. Haltner, Across Barriers GmbH, Saarbrücken/D

Nanotechnology to increase the bioavailability of active pharmaceutical ingredients: instrumentation and biopharmaceutical evaluation
J. Mensch, G. Verreck, I. Van Assche, M. Brewster, Janssen Pharmaceutica N.V., Beerse/B

Challenges in online analytics
H. Weichert, Sartorius Stedim Biotech GmbH, Göttingen/D

In vitro percutaneous absorption for safety evaluation – comparison of international guidelines
U. Bock, E. Haltner, Across Barriers GmbH, Saarbrücken/D

Production of drug loaded liposomes with a novel stirred bead mill
B. Joost, FHNW – School of Life Sciences, Muttenz/CH; P. Hug, Willy A. Bachofen AG, Muttenz/CH; M. Studer, FHNW – School of Life Sciences, Muttenz/CH

Consens, Hall 4.C

Water for industrial use

Process and waste water treatment (continued)

14:00 **Modern wastewater treatment solutions in a state-of-the-art pharmaceutical production environment**
J. Canga Rodriguez, E. Billenkamp, EnviroChemie GmbH, Rossdorf/D

14:30 **Elimination of pharmaceutical trace pollutants – the electrochemical approach**
S. Hild, K.-M. Mangold, C. Weidlich, DECHEMA e.V., Frankfurt/D; T. Augenstein, H. Schell, A. Tiehm, TZW, Karlsruhe/D

15:00 **Evaluation of AOPs for the treatment of micropollutants in water**
T. Scheers, L. Jacoby, Leuven University College/B; L. Appels, J. Van Impe, R. Dewil, Catholic University of Leuven/B

15:30 **Electrochemical oxidation of wastewater constituents; performance of boron-doped diamond (BDD) anodes**
D. Woisetschläger, TU Graz/A; B. Humpl, M. Koncar, VTU Technology, Graz/A; M. Siebenhofer, TU Graz/A

16:00 **Development and testing of a new technology to avoid the emission of perfluorinated surfactants from wastewater**
F. Schuricht, TU Dresden/D et al.

16:30 **A comprehensive study on waste water treatment using a photo-impinging streams reactor: RTD and reactor modelling**
M. Sohrabi, S.J. Royaee, Amirkabir University of Technology, Tehran/IR

17:00

Entente, Hall 4.C

Axelera and Trimatec*

Dynamic French clusters on sustainable process developments

Kamel Ramdani, Marc Aurousseau: Presentation of the Axelera Eco-processes platform. From 2008, Axelera supports collaborative projects! in the field of sustainable development, regrouping industrial, SME and academics. The overview presentation will focus on the projects and the highlights, from sustainability index development to process intensification, supporting energy efficiency and water management. Stéphane SARRADE, IFS (French experts on supercritical fluids technologies) – Competitiveness cluster TRIMATEC: Supercritical fluids and membranes technologies, tools for green chemistry

For more information please see www.achema.de/congress

* Co-organisers: K. Ramdani, Rhodia (Solvay group); M. Aurousseau, Grenoble INP-Pagora – Competitiveness cluster Axelera

Alliance, 4.C

Pharmaceutical production

Cleaning and pollution prevention

Keynote lecture

Addressing microbial contamination of process equipment: critical cleaning, engineering and disinfecting
P. Lopolito, STERIS Corporation, Saint Louis, MO/USA

Pollution prevention and waste minimisation in the pharmaceutical industry
Y. Brems, J.P.K. Seville, J. Baeyens, Warwick University, Coventry/UK

Rouging in biopharmaceutical manufacturing systems: theory, removal and prevention
P. Lopolito, STERIS Corporation, Saint Louis, MO/USA

Logos/Genius, Hall 9.1

Bionik im Betrieb

10:00 Begrüßung
S. Sabisch, Hessisches Ministerium für Wirtschaft, Verkehr und Landesentwicklung, Wiesbaden/D; S. Belzer, Bionik-Sigma – Sigrid Belzer und Martin Zeuch GbR, Darmstadt/D; C. Steinbach, DECHEMA e.V., Frankfurt/D

10:15 Verteilte Intelligenz für technische Anwendungen
T.A. Runkler, Siemens AG, München/D

10:45 Evolutionsstrategie – Optimieren, Verbessern oder Anpassen nach dem Vorbild der biologischen Evolution
M. Herdy, INPRO Innovationsgesellschaft für fortgeschrittene Produktionssysteme in der Fahrzeugindustrie mbH, Berlin/D

Sex sells! – Was die Natur in Betrieb hält
M. Hollermann, die Bioniker GbR, Bremen/D

BIOPS: Biologie-inspiriertes Problemlösen und Suchwerkzeug im Ideenreservoir der Natur
T. Le, Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO, Stuttgart/D

Podiumsdiskussion

Esprit, Hall 9.1

Bioprocesses

Biocatalysis

Biocatalytic coating reactors for simplifying multi-phase processes
J. Gosse, E. Surdo, S. Thust, M. von Keitz, BioCee, Inc., Saint Paul, MN/USA

Modelling and upscaling of a biocatalytic cascade oxidation in a dynamic membrane aeration reactor
W. Van Hecke, VITO – Flemish Institute for Technological Research, Mol/B; D. Haltrich, University of Natural Resources and Life Sciences, Vienna/A; B. Frahm, Ostwestfalen-Lippe University of Applied Science, Lemgo/D; H. Brod, Bayer AG, Leverkusen/D; R. Ludwig, University of Natural Resources and Life Sciences, Vienna/A

Performance of enzyme membrane reactor for continuous production of fructooligosaccharides
Z. Kovács, L. Born, J. Hild, Giessen University of Applied Sciences/D; P. Czermak, University of Applied Sciences, Giessen/D and Kansas State University, Manhatten, KS/USA

Biocatalytic oxidation in continuous flow
P. Dickson, AM Technology, Runcorn/UK; E. Jones, C-Tech, Chester/UK; G. Gasparini, AM Technology, Runcorn/UK; K. Mc Clean, C-Tech, Chester/UK; I. Archer, Ingenza, Midlothian/UK

In vivo immobilisation of enzyme on bacterial polyester inclusions
S.Y. Chen, T.Y. Huang, S.X. Lu, Yuan Ze University, Chung-Li/TW

Dialog, Hall 9.2

Biorefineries and processing of renewables

Biogas production

Generation of biogas from textile desizing liquors 10:30
K. Opwis, T. Mayer-Gall, J.S. Gutmann, Deutsches Textilforschungszentrum Nord-West e.V., Krefeld/D; C. Dammer, T. Titscher, A. Nickisch-Hartfiel, Niederrhein University of Applied Sciences, Krefeld/D; O. Grün, C. Spurk, ÖKOBiT GmbH, Föhren/D; C. Schloderer, A. Köppe, Textilveredlung an der Wiese, Lörrach/D; C. Dörfler, H. Bachus, CHT R. Beitlich GmbH, Tübingen/D

Production of methane from biomass by hydrothermal gasification – steps from the laboratory to the demonstration plant 11:00
O. Kröcher, F. Vogel, M. Lemann, Hydromethan AG, Villigen PSI/CH

Novel anaerobic MBR technology turns waste from biofuel production into main energy source through biogas production 11:30
J. Van der Lubbe, J.H.F. Pereboom, Biothane, Delft/NL; A. Grélot, Veolia Water Research Centre, Maisons-Lafitte/F

Optimising gas yield in the biogas production from biomass using statistical design of experiments (DoE) 12:00
P. Solot, S. Feiler, AICOS Technologies AG, Basel/CH; H. Schneider, Flensburg University of Applied Sciences/D

12:30

Logos/Genius, Hall 9.1

Bionik im Betrieb

Tandem lecture
Smartbird: Der Traum vom Fliegen
W. Send, Aniprop GbR, Göttingen/D

Bionic Learning Network – Lernen von der Natur
R. Volk, Festo AG & Co. KG., Esslingen/D

Hochleistungsstrukturen mit bionischer Verstärkung
L. Kroll, TU Chemnitz/D

Molekulare Simulation als Werkzeug der Nanotechnik
F. Müller-Plathe, TU Darmstadt/D

Pneumatische Strukturen und bionisches Antriebskonzept
S. Michel, Empa, Dübendorf/CH

Self healing materials: an alternative approach to make materials perform better
S. van der Zwaag, TU Delft/NL

Zusammenfassung und Highlights der Veranstaltungsreihe Bionik im Betrieb
S. Belzer, Bionik-Sigma – Sigrid Belzer und Martin Zeuch GbR, Darmstadt/D

Esprit, Hall 9.1

Bioprocesses

Bio(micro)reactors

13:30 Plenary lecture
cf. room Dialog, Hall 9.2

Modelling approach for the whole-cell bioprocesses in a microreactor
E. Borovinskaya, W. Reschetilowski, TU Dresden/D

Scale down from shake flasks into microtiter plates: cultivation of *Trichoderma reesei* under consideration of a comparable oxygen supply
H. Giese, RWTH Aachen/D; R.W.J. Hommes, P. Kruithof, Genencor International B.V., Leiden/NL; K. Meier, J. Büchs, RWTH Aachen/D

Automated microtiter plate based cultivations for optimisation of secretory protein expression
P. Rohe, D. Venkanna, R. Freudl, W. Wiechert, M. Oldiges, Research Center Juelich/D

Microtiter scale determination of growth and productivity in *Corynebacterium glutamicum*
F. Käß, A. Prasad, W. Wiechert, M. Oldiges, Forschungszentrum Jülich GmbH/D

Fermentation at picoliter scale – microfluidics for single cell analysis of prokaryotic production strains
A. Gruenberger, C. Probst, W. Wiechert, D. Kohlheyer, Forschungszentrum Jülich GmbH/D

Novel solution for cell culture in microtitre plates
D. Bruecher, Infors AG, Bottmingen/CH; G.J. Lye, UCL, London/UK

Dialog, Hall 9.2

Biorefineries and processing of renewables

Biorefinery concepts

13:30 Plenary lecture
Brighter living with enzymes 14:00
O. May, DSM Pharmaceutical Products, Geleen/NL

Process development of a lignocellulose biorefinery with several feedstocks 14:30
D. Ludwig, T. Hirth, University of Stuttgart/D; S. Rupp, S. Zibek, Fraunhofer-Institut für Grenzflächen- und Bioverfahrenstechnik IGB, Stuttgart/D

The first German bioeconomy cluster 15:00
S. Witt, JSW Consulting GmbH, Berlin/D; M. Wolperdinger, Linde KCA GmbH, Dresden/D; T. Hirth, Fraunhofer-Institut für Grenzflächen- und Bioverfahrenstechnik IGB, Stuttgart/D; M. Zscheile, Hochschule Rosenheim/D

Conversion of bio-based alcohols to bioolefines and biopolymers 15:30
M. Buchmann, K. Bronnenmeier, Biotechnology Plants, Dresden/D

NGP² next generation processes and products 16:00
J. Buechs, W. Marquardt, T. Melin, M. Modigell, A. Pfennig, A. Spiess, M. Wessling, RWTH Aachen/D

Keynote lecture 16:30
Cluster BIOREFINERY2021
R. Grote, TU Hamburg-Harburg/D

17:00

Harmonie 1, CMF

Energy efficiency by integrated processes

Drying

10:30 **Energy efficient freeze drying**
J. Philipp, GEA Lyophil GmbH, Hürth/D

11:00 **Energy-efficient drying of medicinal plants with air recirculation**
T. Ziegler, T. Teodorov, J. Mellmann, Leibniz Institute for Agricultural Engineering, Potsdam/D

11:30 **Homogenization of the drying conditions in mixed flow grain dryers**
H. Scaar, F. Weigler, J. Mellmann, Leibniz Institute for Agricultural Engineering, Potsdam/D

12:00 **Drying, solvent recovery, heating, cooling and reaction control of various materials with the paddle type indirect heating system with higher efficiency and cost saving**
S. Nagare, Nara Machinery Co., Ltd., Tokyo/J

12:30

Harmonie 2, CMF

Safety

Shaping the future of process safety in Europe*

EPSC: state of the practice
C. Jochum, European Process Safety Centre, Rugby/UK

Steering in the right direction?
P. Knijff, DSM, Heerlen/NL

Competence – the ultimate safety barrier
P. Delanoy, Dow Chemical Company, Kings Lynn/UK

How critical is safety critical?
R. Gowland, European Process Safety Centre, Rugby/UK

Auditing process safety
L. Allford, European Process Safety Centre, Rugby/UK

13:00 EPSC Award 2012

Harmonie 3, CMF

Solids processing

Separation technologies

Micro mixer for particle precipitation: application and scale-up
F. Herbstritt, J. Heck, Ehrfeld Mikrotechnik BTS GmbH, Wendelsheim/D; O.F.-K. Schlüter, V. Michele, Bayer Technology Services GmbH, Leverkusen/D

Direct production of active pharmaceutical ingredients from multicomponent solutions by membrane-based crystallisation technology
G. Di Profio, Institute on Membrane Technology, Rende/I; A. Caridi, University of Calabria, Rende/I; R. Caliandro, A. Guagliardi, Institute of Crystallography, Bari/I; E. Curcio, E. Drioli, University of Calabria, Rende/I

Dielectrophoresis for intensified particle fractionation
J. Thöming, M. Baune, F. Du, University of Bremen/D

Harmonie 1, CMF

Energy efficiency by integrated processes

Integrated separations

14:00 **13.30 Plenary lecture**
Recycling of technology metals – a key contribution to secure a sustainable supply
C. Hagelüken, Umicore AG & Co. KG, Hanau/D

14:30 **Keynote lecture**
Hybrid separations: from process design to industrial applications
A. Górak, TU Dortmund/D:W. Marquardt, RWTH Aachen/D; P. Kreis, Evonik Industries AG, Marl/D

15:00

15:30 **Intensified transesterification of propylene carbonate by combination of reactive distillation and organoselective vapour permeation**
J. Holtbruegge, A. Górak, TU Dortmund/D

16:00 **Evaluating improved separation efficiency with heat integrated distillation columns (HIDiC): performing rigorous feasibility studies utilising newest modelling techniques**
P. Lawrence, Z. Urban, C. Möllmann, J.C. Mani, Process Systems Enterprise, London/UK

16:30 **Heterogeneous catalysed esterification of n-butanol and acrylic acid using reactive distillation**
A. Niesbach, R. Fuhrmeister, A. Górak, TU Dortmund/D

17:00 **Process optimatisation using membrane distillation for concentration of fruit juice and pharmaceutical products**
V. Sapkal, S. Chawande, Sant Gadgebaba Amravati University/IND; P. Sapkal, Institute of Chemical Technology, Mumbai/IND; R. Sapkal, Sant Gadgebaba Amravati University/IND

Harmonie 2, CMF

Safety

Risk management

Keynote lecture
Security for safety
S. Ditting, HIMA Paul Hildebrandt GmbH & Co. KG, Brühl/D

Operational risk management: How to improve safety through prevention?
K. Földesi, SAP Deutschland AG & Co. KG, Walldorf/D

Variabilisation: managing your risks effectively – New concepts for process industry operations & maintenance
S. Grüßer, InfraServ GmbH & Co. Knapsack KG, Hürth/D

Industrial security and risk management: towards chemical compliance within global trade processes
J. Kaack, Si Pro GmbH, Mannheim/D

Safely sustaining the future for the chemical industry
N.H.A. Versloot, TNO, Rijswijk/NL; A.I. Van Berkel, TNO, Delft/NL; J.J. Meulenbrugge, TNO, Utrecht/NL; A.L. Hollander, TNO, Hoofddorp/NL

*organised by European Process Safety Center (EPSC), Rugby/UK

Harmonie 3, CMF

Solids processing

Process design

Challenges in design and start-up of processes dealing with solids
K. Bauer, G. Hofmann-Jovic, M. Strack, InfraServ GmbH & Co. Knapsack KG, Hürth/D

Towards better equipment design strategies for powder processing – improving understanding by means of enhanced powder characterisation
T. Freeman, Freeman Technology, Malvern/UK; M. Mayer, AZO GmbH & Co. KG, Stuttgart/D

Efficient formulation and process development for spray drying applications
J. Sloth, J. Jensen, T. Ullum, GEA - Process Engineering A/S, Soeborg/DK

Discrete investigation of solid mass flow in mixed flow grain dryers
F. Weigler, H. Scaar, J. Mellmann, Leibniz Institute for Agricultural Engineering Potsdam-Bornim e.V./D

Optimisation of prismatic spouted bed apparatuses using a novel experimental setup and discrete particle modelling
V. Salikov, S. Antonyuk, S. Heinrich, TU Hamburg-Harburg/D; V.S. Sutkar, N.G. Deen, J.A.M. Kuipers, TU Eindhoven/NL

Particle surface modification and development of composite materials by a hybridiser system
S. Nagare, Nara Machinery Co., Ltd., Tokyo/J

Modelling of a spray drying process for flowsheet-based solids process design
M. Pinto, S. Bermingham, Process Systems Enterprise Limited, London/UK

Harmonie 4, CMF

Mixing and separation technology

Nanofiltration, gas separation

Mixed ion electron conducting gas separation membranes for application in ceramic membrane reactors
F. Snijkers, V. Middelkoop, M. Jacobs, J. Van Noyen, A. Buekenhoudt, Flemish Institute for Technological Research (VITO nv), Mol/B

Environment friendly technology for decolorization of organic solvents with NF membranes
F.P. Cuperus, I.M. Wienk, SolSep BV, Apeldoorn/NL

Separation performance of SRNF membranes for organic solvent mixtures
L. Wessely, W.M. Samhaber, University of Linz/A

Purification of industrial wastewater by separation of sulphate using nanofiltration and seeding technology
T. Peters, Dr.-Ing. Peters Consulting For Membrane Technology And Environmental Engineering, Neuss/D

Desalination of acidic and sweet whey by nanofiltration
Z. Kovács, Giessen University of Applied Sciences/D; A. Román, G. Vatai, A. Ittzés, Corvinus University, Budapest/H; M. Grachten, University of Linz/A; P. Czermak, Giessen University of Applied Sciences/D and Kansas State University, Manhatten, KS/USA

Spektrum, CMF

International powder & nanotechnology forum*

Template free synthesis of BEA zeolite and application
T. Okubo, University of Tokyo/J

Synthesis and application of porous coordination polymers
M. Hartmann, University of Erlangen-Nuremberg/D

Supercritical hydrothermal synthesis of organic modified nanoparticles. Toward super hybrid materials.
T. Adschiri, Tohoku University/J

Material synthesis by using supercritical fluid
N.N.

Conclusio 1, CMF

Sustainable laboratories

Safety*

10:30 **Decontamination effectiveness of single-head emergency showers**
K. Breitkreuz, V. Heil, K. Meller, U. Seifert, Fraunhofer UMSICHT, Oberhausen/D; T. Brock, German Social Accident Insurance Institution for the Raw Materials and Chemical Industry, Heidelberg/D

11:00 **Safe labs versus green labs: is there a way to protect the environment without compromising safety?**
C. Herry, Erlab D.F.S., Val de Reuil/F

11:30 **Why buying safety cabinets for flammable and chemical products: norms and choice criteria**
L. Cargnello, Labor Security System, Santa Lucia di Plave/I

12:00 **New approaches to safe fume cupboards**
K. Doyuran, Köttermann GmbH & Co. KG, Uetze/Hänigsen/D

12:30 **Experimental lecture**
Solutions for the safe storage and handling of hazardous materials in work areas
S. Kunkel, asecos GmbH, Gründau/D

Harmonie 4, CMF

Mixing and separation technology

Extraction

13:30 **Plenary lecture**
cf. room Harmonie 1, CMF

Experimental and theoretical investigation of antibody distribution in aqueous two-phase systems
J. Mündges, A. Prinz, T. Zeiner, A. Górak, TU Dortmund/D

A computational fluid dynamics simulation tool for the simulation of liquid-liquid extraction columns
M. Hlawitschka, F. Chen, H.-J. Bart, H. Hagen, TU Kaiserslautern/D

CFD-supported design of internals geometry of rotating disc contactors
E. Aksamija, R. Pfeffer, M. Siebenhofer, TU Graz/A

Modelling of reactive extraction of lactic acid with organophosphorus compounds
S. Lux, M. Siebenhofer, TU Graz/A

Liquid-liquid extraction and extraction by emulsion in white biotechnologies: example of gallic acid
K. Yim, M. Stambouli, D. Pareau, Ecole Centrale Paris/F

Determination and prediction of transient droplet populations
M. Mickler, TU Kaiserslautern/D; S. Didas, Fraunhofer ITWM, Kaiserslautern/D; H.-J. Bart, TU Kaiserslautern/D

Spektrum, CMF

International powder & nanotechnology forum*

Nanoparticles dispersion/aggregation behavior control for its application in various field
H. Kamiya, Tokyo University of Agriculture and Technology/J

From molecules to materials: the cluster of excellence „engineering of advanced materials"
W. Peukert, University of Erlangen-Nuremberg/D

Template-free fabrication of ordered grid array of colloidal particles by convective self-assembly
M. Miyahara, Kyoto University/J

Fabrication and wetting properties of superhydrophobic and superamphiphobic layers made from particles
H.-J. Butt, Max Planck Institute for Polymer Research, Mainz/D

Improvement of pulverized coal combustion by the application of powder technology
H. Makino, Central Research Institute of Electric Power Industry, Tokyo/J

Pulverized coal combustion in O_2/CO_2 – atmosphere
R. Kneer, RWTH Aachen/D

Open discussions for future development
Chair: H. Kamiya, Tokyo University of Agriculture and Technology/J
J. Ulrich, University of Halle-Wittenberg/D

* organised by Committee IPTF2012

Conclusio 1, CMF

Laboratory and analytical techniques

Hand-held spectrometers**

14:00 **New developments and applications of hand-held raman, mid-infrared and near-infrared spectrometers**
F. Pfeifer, D. Sorak, H. Siesler, University of Duisburg-Essen/D

14:30 **Recent advances in ultra-compact infrared spectrometers enabled by thin film linear variable filter technology**
N. O'Brien, D. Friedrich, C. Hulse, F. Van Milligen, M. Von Gunten, JDS Uniphase Corp., Santa Rosa, CA/USA

15:00 **Handheld XRF, NIR, FT-IR & Raman spectrometers – trends and applications**
D. Keutel, D. Boehme, analyticon instruments GmbH, Rosbach v. d. Hoehe/D

15:30 **Recent developments in the use of hand-held NIR in field and manufacturing applications**
D. Klevisha, I. Nazarov, Thermo Fisher Scientific, Wilmington, MA/USA

16:00 **Advances in handheld Raman and FTIR and their relevance in chemical/pharmaceutical applications**
M. Hargreaves, R. Green, L. Zhang, W. Jalenak, C. Gardner, Thermo Fisher Scientific Inc., Wilmington, MA/USA

16:30 **Mobile FT-IR spectroscopy and its applications**
P. Tang, Agilent Technologies, Imc., Danbury, CT/USA; P. Schullerer, Polytec GmbH, Waldbronn/D

17:00 **Recent technological advances unleash the analytical power of an 80 year old spectroscopic technique – Raman spectroscopy**
B. Denton, University of Arizona, Tucson, AZ/USA; H. Grodzins, J. Pasmore, D. Morse, Rigaku Raman Technologies, Inc., The Woodlands, TX/USA

* in cooperation with DIN TC "Laboratory equipment"
** organised by H. Siesler, University of Duisburg-Essen/D

Conclusio 2, CMF

NanoCom training factory*

10:30

Best practices to lower the barriers for commercialisation of nanotechnology

11:00

Research (funded by the EU 7th Framework Programme)

The NanoCom coordinated action will contribute to bridging the gap between lab based and industrial applications in nanotechnology by creating a European wide approach and mechanisms for lowering the barriers and spreading best open innovation practices for rapid commercialisation and

11:30

investment in innovative nanotechnology driven products.

Against this background the innovation training factory for entrepreneurs and scientists takes place. Renowned experts act as trainers and share their knowledge regarding technical basics, business development, financing, and open innovation.

12:00

12:30

Fantasie 1, CMF

Advanced reaction engineering

Analytics

In-situ FT-IR reaction monitoring using standard detector

F. Despagne, ABB, Bordeaux/F

Combustion in porous media – flame monitoring based on the electric properties of open celled silicon carbide foams

F. Marschallek, R. Herre, M. Jahn, A. Michaelis, Fraunhofer IKTS, Dresden/D

Investigation on noninvasive temperature measurement in radial and axial direction in multi-phase reactors by means of a fiber bragg grating sensor – experimental trails and simulative validation

C. Hecht, S. Müller, M. Grünewald, Ruhr-Universität Bochum/D

Demonstration of continuous reactors with in-line analytics for fine-chemical production

M. de Graaff, M. Rooijen, TNO, Delft/NL

Fantasie 2, CMF

Plant control

Process data analysis, monitoring and automation

Increasing productivity by operator effectiveness

L. Lo Curto, A. Haller, ABB Automation GmbH, Frankfurt am Main/D

A software platform for configuration-free analysis of process data

M. Soemers, AixCAPE e.V., Aachen/D

Improve plant operations with mobile devices, KPI's and alerts – anytime, anywhere!

J. Kasper, M. Gallant, Aspen Technology, Inc., Burlington, MA/USA

Substantial workflow support for data pre-processing

Y. Heng, M. Soemers, M. Theißen, AixCAPE e.V., Aachen/D

Conclusio 2, CMF

NanoCom training factory* (continued)

14:00

Target audience

Every scientist who is interested in "How to commercialise research results?" and every scientist who wants to know "How to transfer ideas into merchantable products?". It does not matter if you already have an idea or not or if you perhaps already have a business plan. Participate in the training factory and receive new information about best practices for commercialisation of nanotechnology research.
For this training factory no additional charge is imposed.

14:30

Modules

15:00

Technical basics – Business development – Financing – Open innovation and collaboration – External view (NanoCom Satellite Partner) – Sum up and close

For more details see http://www.nanocom-eu.org

15:30

16:00

16:30

17:00

Fantasie 1, CMF

Advanced reaction engineering

Modelling/kinetics

13:30 Plenary lecture
cf. room Harmonie 1, CMF

Optimisation of progress curve experiments for reaction kinetics identification

K.F. Mahnken, A.C. Spiess, RWTH Aachen/D

Design and scale-up of a high-performance multitubular reactor for propylene oxide

A. Cano, Process Systems Enterprise, Inc., Cedar Knolls, NJ/USA

Efficient catalyst-to-reactor methodologies for novel chemical reactor design and scale-up

Z. Urban, Process Systems Enterprise Limited, London/UK

One-stage process of water gas shift in a Pd-based membrane reactor

G. Barbieri, A. Brunetti, A. Caravella, National Research Council, Rende/I; E. Drioli, National Research Council and University of Calabria, Rende/I

Two phase dispersion in a downflow bubble column

S. Majumder, Indian Institute of Technology, Guahati/IND; G. Kundu, D. Mukherjee, Indian Institute of Technology, Kharagpur/IND

Kinetic study of ethyl mercaptan oxidation in presence of merox catalyst

M. Ehsani, A. Safadoost, R. Avazzadeh, TU Isfahan/IR

Fantasie 2, CMF

Laboratory and analytical techniques

Foams, emulsions and liquids

Liquid foams – applications, characteristics, methods

T. Schörck, KRÜSS GmbH Wissenschaftliche Laborgeräte, Hamburg/D

High sensitivity viscosity solution for industrial applications

L. Belliere, Sofraser, Villemandeur/F

Passive microrheology: non intrusive measurement of emulsion and gel viscoelasticity

C. Tisserand, M. Fleury, L. Brunel, P. Bru, G. Meunier, Formulaction, L'Union/F

Measurement of x-ray profiles – a new method for the evaluation of separation behaviour of concentrated nontransparent dispersions

A. Zierau, A. Fedur, T. Sobisch, D. Lerche, LUM GmbH, Berlin/D

Conductivity measurements as a technique to determine emulsifier efficiency

S. Petersen, J. Ulrich, University of Halle-Wittenberg, Halle/D

Anaerobic co-digestion of waste activated sludge with fats, oil and grease

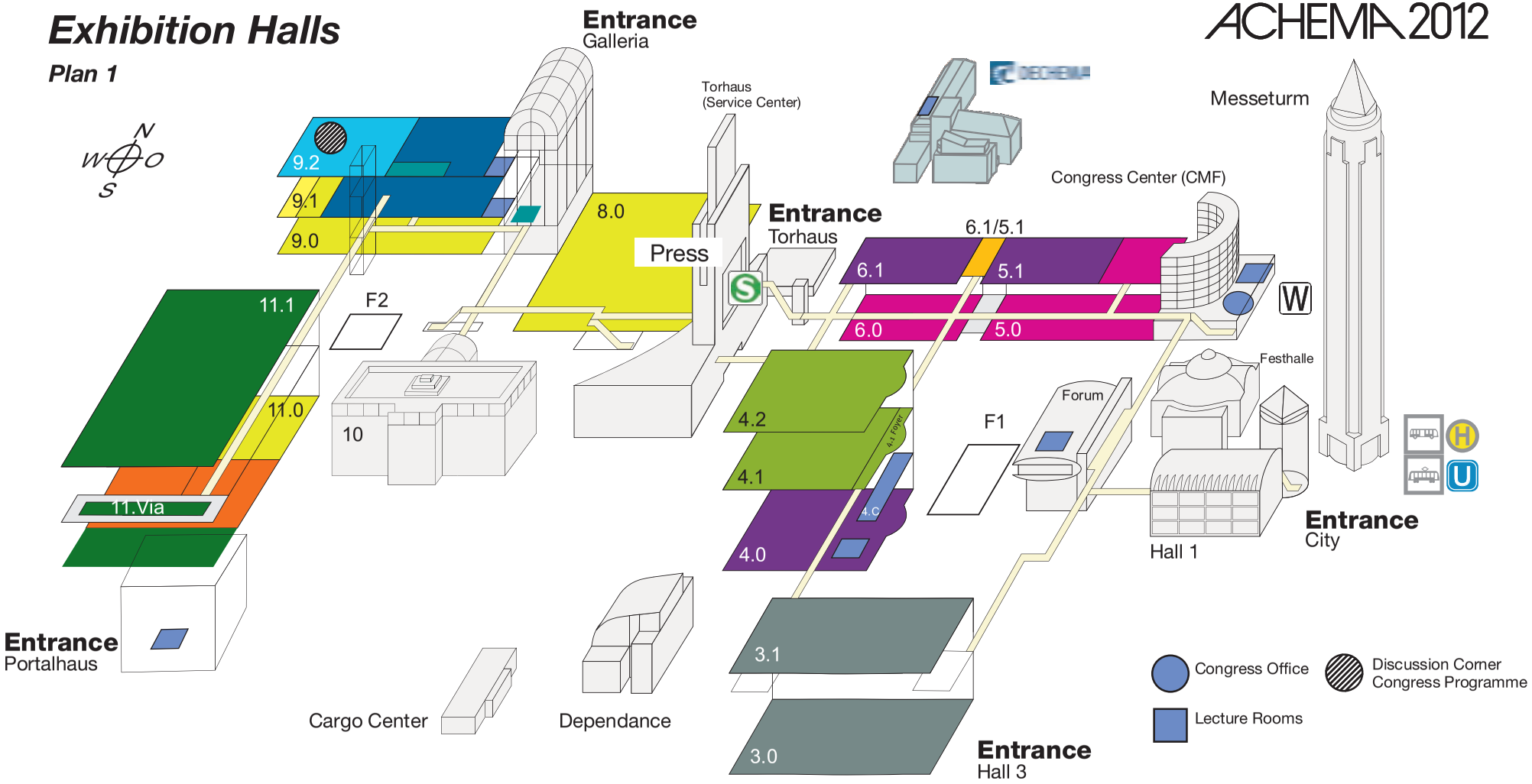
J. Lauwers, L. Appels, S. Taes, J. Van Impe, R. Dewil, Catholic University of Leuven/B

* organised by the EU project consortium NanoCom

Exhibition Halls

Plan 1

ACHEMA 2012



- Research and Innovation
- Literature, Information, Learning and Teaching Aids
- Laboratory and Analytical Techniques
- Engineering
- Mechanical Processes
- Thermal Processes
- Pumps, Compressors, Valves and Fittings
- Pharmaceutical, Packaging and Storage Techniques
- Industrial and Labour Safety
- Instrumentation, Control and Automation Techniques
- Materials Technology and Testing
- Special Show
- General Topic Environmental Protection
- General Topic Biotechnology

- W — Departure: excursions, factory tours
- S-Bahn (surface rail) Lines S3, S4, S5, S6
- U-Bahn (underground) Line U4
- Tram/Bus stop
- Tram 16, 17
- Bus 32, 50

CMF
Conclusio 1 + 2
Fantasie 1 + 2
Harmonie 1 - 4
Illusion 1 - 3
Spektrum

Hall 4.C
Alliance
Consens
Entente

Hall 4.0
Europa

Forum

DECHEMA House
Franz Patat Auditorium

Hall 9.1
Esprit
Genius/Logos

Hall 9.2
Dialog

Portalhaus-Via
Frequenz

		Expert Round Table Forum Level 0/ Discussion Corner Hall 9.2	**Harmonie 1** CMF*	**Harmonie 2** CMF*	**Harmonie 3** CMF*	**Harmonie 4** CMF*	**Spektrum** CMF*	**Conclusio 1** CMF*	**Conclusio 2** CMF*	**Fantasie 1** CMF*	**Fantasie 2** CMF*	**Illusion 1** CMF*
Sunday, 17 June	**16:00**	**Opening Session at the CongressCenter Messe Frankfurt**										
Monday, 18 June	**10:30**	**Panel Discussion** Bio-Ökonomie (11:00–12:30, Forum)	**Energy efficiency by integrated processes** Chemical and biotechnological processes	**Safety** European safety regulation/Seveso	**Energy storage, tranport and use** Electrochemical energy storage	**Mixing and separation technology** Ceramic membranes for challenging filtration tasks	**Process analytics** Industrial applications	**Sustainable laboratories** Concepts and buildings	**Mixing and separation technology** Distillation: design	**Advanced reaction engineering** Petrochemicals	**Plant control** Advanced process control	**Plant component** Optimisation and design of process and reactor
	13:30				**Plenary lecture** P. van Son							
	14:00/ 14:30	**Implementing equipment innovations: overcoming the hen-and-egg problem** (14:30, Hall 9.2)	**Mixing and separation technology** Filtration media and modelling	**Safety** Concepts and methods	**Energy storage, tranport and use** Hydrogen	**Mixing and separation technology** Membrane processes	**Process analytics** Novel techniques	**Sustainable laboratories** Planning, controlling and operation	**Mixing and separation technology** Product design	**Advanced reaction engineering** Process intensification	**Laboratory and analytical techniques** Lab engineering and processes	**Plant component** Heat exchangers
Tuesday, 19 June	**10:30**	**Panel Discussion** Abfall als strategische Ressource von morgen (11:00–12:30, Forum)	**Energy efficiency by integrated processes** Environmental applications	**Safety** Devices and systems	**Chemical nanotechnology**	**Mixing and separation technology** Distillation: modelling and control	**Process analytics** Life science	**Sustainable laboratories** Ventilation, energy and economy	**High performance heat exchangers** Course	**Advanced reaction engineering** Particle technology	**Plant control** Sensors and actuators	**Plant component** Pipes & pumps
	13:30											
	14:00/ 14:30	**Stoffliche Nutzung von CO_2** (15:00, Forum)	**Chemical leasing**	**Safety** Devices and systems	**Energy storage, transport and use** Thermal energy storage	**Mixing and separation technology** Filtration apparatus and processes	**International powder & nanotechnology forum**	**Sustainable laboratories** Furnishing	**High performance heat exchangers** Course	**Advanced reaction engineering** Polyreactions	**Managing corrosion with Teflon®**	**Microreaction engineering**
Wednesday, 20 June	**10:30**	**Panel Discussion** Der schnellste Weg zur Elektro-mobilität – was ist die beste Innovationsstrategie? (11:00–12:30, Forum)	**Energy efficiency by integrated processes** Drying	**Safety** Shaping the future of process safety in Europe	**Solids processing** Separation technologies	**Mixing and separation technology** Nanofiltration, gas separation	**International powder & nanotechnology forum**	**Sustainable laboratories** Safety	**NanoCom traninig factory**	**Advanced reaction engineering** Analytics	**Plant control** Process data analysis, monitoring and automation	**Plant component** Process technolog plant component procurement
	13:30		**Plenary lecture** C. Hagelüken									
	14:00/ 14:30	**Strategies for sustainable laboratories** (15:00 Forum] **Campus Blasensäulen – verbesserte Messtechniken und Modelle zur Prozessführung und Auslegung** (14:30 Hall 9.2)	**Energy efficiency by integrated processes** Integrated separations	**Safety** Risk management	**Solids processing** Process design	**Mixing and separation technology** Extraction	**International powder & nanotechnology forum**	**Laboratory and analytical techniques** Hand-held spectrometers	**NanoCom traninig factory**	**Advanced reaction engineering** Modelling/kinetics	**Laboratory and analytical techniques** Foams, emulsions and liquids	**Microreaction engineering**
Thursday, 21 June	**10:30**	**Panel Discussion** Sicherheitsforschung in der Nanotechnologie (11:00–12:30, Forum)	**Energy efficiency by integrated processes** Heat recovery – apparatus and operational aspects	**Safety** Theoretical investigations on industrial safety	**Solids processing** Modelling and experiment	**Electrochemical technologies**	**Laboratory and analytical techniques** Lab automation	**Sustainable laboratories** Fume cupboards and air technology	**Adhesive bonding**	**Advanced reaction engineering** Advanced materials	**Plant control** Plant asset management	**Plant component** Flanges, sealing systems, piping
	13:30		**Plenary lecture** J.C. Schouten									
	14:00/ 14:30	**Informationsplattform für Ingenieure in der Produktion** (14:30, Forum)	**Energy efficiency by integrated processes** Heat integration and heat recovery	**Safety** Experimental investigations on safety characteristics	**Solids processing** Fluidised beds	**Electrochemical technologies**	**Management of plants and assets** IT systems and strategies	**Laboratory and analytical techniques** Advances in analytical techniques	**Mixing and separation technology** Distillation: multicomponent systems and multiphase flow	**Advanced reaction engineering** Microreaction technology/flow chemistry	**Laboratory and analytical techniques** Particle and nanoparticle analysis	**Plant component** Pumps and valves
Friday, 22 June	**10:30**	**Flow chemistry and beyond: the future of continuous production** (Hall 9.2)	**Energy efficiency by integrated processes** Energy management	**Safety** Risk identification and analysis	**Solids processing** Processing	**Mixing and separation technology** Liquid separation	**Management of plants and assets** Concepts and examples	**Laboratory and analytical techniques** Quality management and monitoring	**Mixing and separation technology** Mixing	**Reaction modelling for layout and control**	**Plant control** Field devices	**Plant component** Mechanical separators, drives & motors
	14:00 – 16:30	**Closing Colloquium, Forum Level 0**										

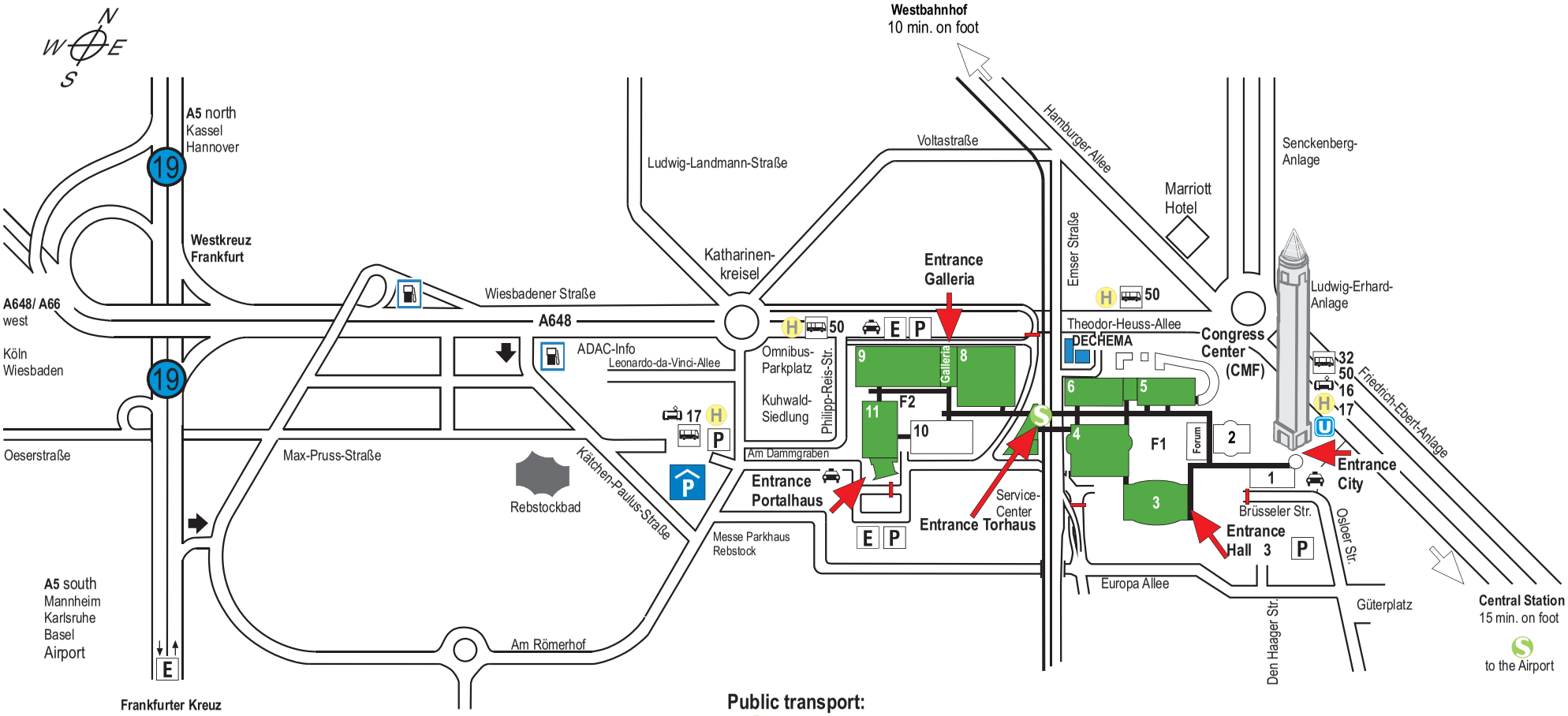
*CongressCenter Messe Frankfurt

	Illusion 2	Illusion 3	Europa 1	Consens	Entente	Alliance	Logos/ Genius	Esprit	Dialog	DECHEMA-House	General Events
	CMF*	CMF*	Hall 4.0	Hall 4.C	Hall 4.C	Hall 4.C	Hall 9.1	Hall 9.1	Hall 9.2		
s	**CO_2 separation and utilisation** CO_2 capture	**ICOSSE International Congress on Sustainability Science and Engineering**	**Advanced fluids in process engineering** Properties and characterisation		**Experience in advanced pharmaceutical technology**	**Pharmaceutical production** Filling and containment	**Bioprocesses** (Bio)chromato-graphy	**Bioprocesses** Bio-based production	**Biorefineries and processing of renewables** Platform chemicals		10:30 **Bio-economy in Eastern Europe** Hall 4.0, Room Europa 2 12:30 **Automation im Dialog** Portalhaus, Room Frequenz 17:00 **ACHEMA-Medienpreis** Forum, Level 1, Room Panorama 18:00 **Meet your friends** Forum, Level 0
										13:00 **Fortbildungstag für Lehrer** Carl Duisberg Auditorium	
s	**CO_2 separation and utilisation** CO_2 utilisation	**ICOSSE International Congress on Sustainability Science and Engineering**	**Advanced fluids in process engineering** Applications		**Experience in advanced pharmaceutical technology**	**Pharmaceutical production** Apparatus and methods	**Bioprocesses** Maesurement and modelling	**Bioprocesses** Environmental biotechnology	**Biorefineries and processing of renewables** Alternative feedstocks and processes		
s	**CO_2 separation and utilisation** CCU – novel approaches	**Perspectives 2012: chemical and pharmaceutical production in Germany** Key success factors for Germany's competetive edge		**Water for industrial use** Process and waste water treatment	**E-learning**	**Pharmaceutical production** Development of pharmaceuticals	**Bionik im Betrieb**	**Bioprocesses** Biocatalysis	**Biorefineries and processing of renewables** Biogas production		10:00 **Industrial biotechnology: innovation made in Switzerland** Hall 9.2, Discussion Corner 10:30 **ACHEMA worldwide Wirtschaftsforum China's process industry picking up the pace** Hall 4.0, Room Europa 10:30 **Automation im Dialog** Portalhaus, Room Frequenz 15:30 **India Day** Hall 4.0, Room Europa 13:30 **Informationsveranstaltungen für Schüler** Forum, Level 0 14:30 **Genome-enabled marine biotechnology: data mining marine biodiversity** Hall 9.2, Discussion Corner 17:15 **Japanese Reception** Hall 4.C, Room Concorde 17:30 **Global Chemical Leasing Award 2012** CMF, Room Harmonie 1
									Plenary lecture 0. May		
	Resource productivity & energy efficiency in the chemical industry	**Perspectives 2012: chemical and pharmaceutical production in Germany** Managing site readiness		**Water for industrial use** Process and waste water treatment	**Axelera and Trimatec** Dynamic French clusters on sustainable process developments	**Pharmaceutical production** Cleaning and pollution prevention	**Bionik im Betrieb**	**Bioprocesses** Bio(micro)reactors	**Biorefineries and processing of renewables** Biorefinery concepts		
s	**Materials and materials testing** High-throughput technologies	**BMBF – Research and development for securing our raw material supply**	**Single-use technologies** Concepts	**Nickel alloys, titanium and zirconium in the Chemical Process industry**		**Pharmaceutical production** Sterile production	**Raw materials for biotechnology: synthesis gas, lignocellulose**	**German bioindustry 2021 leading to bioeconomy**	**Biorefineries and processing of renewables** Pyrolysis/biochar		9:00 **European innovation partnership: from knowledge via demonstration to products and markets** Hall 4.0, Room Europa 2 10:30 **Automation im Dialog** Portalhaus, Room Frequenz 13:30 **Informationsveranstaltungen für Schüler** Forum, Level 0 13:30 **BIOCHEM Accelerator Forum** Hall 9.2, Room Motiv 16:00 **BIOCHEM Accelerator Forum: Entrepreneurial teaching classes** Hall 9.2, Room Motiv 19:00 **Frankfurt Evening in the Römer (special invitation)**
										10:00–16:45 **IVSS Workshop „Gase unter Druck"** Franz Patat Auditorial	
	Materials and materials testing Materials testing	**Recycling and urban mining**	**Single-use technologies** Processes	**Nickel alloys, titanium and zirconium in the Chemical Process industry**	**Bioprocesses** Novel bioreactors concepts	**Pharmaceutical production** Process and quality control		**German bioindustry 2021 leading to bioeconomy**	**Biorefineries and processing of renewables** Gasification of biomass		
s	**Materials and materials testing** Materials testing – sealings, joints and composites	**Desalination**	**Industrial heat pumps** Improving energy-efficiency of industrial processes	**Food biotechnology** Whole cells	**Bioprocesses** Cell culture processes	**Pharmaceutical production** Continuous manufacturing and flow processes		**Development and application of novel biocatalysts** Biodegradation of cellulose, lignocellulose and starch	**Biorefineries and processing of renewables** Ionic liquids	9:00–13:30 **IVSS Workshop „Gase unter Druck"** Franz Patat Auditorial	9:00 **European innovation partnership: from knowledge via demonstration to products and markets** Hall 4.0, Room Europa 2 10:30 **Technology Transfer Days** Hall 9.1, Room Logos/Genius 10:30 **BIOCHEM Accelerator Forum: Venture capital day** Hall 9.2, Room Impuls 10:30 **Automation im Dialog** Portalhaus, Room Frequenz 10:30 **Diskussionsrunde Microsoft Visio für das Engineering – Geht denn das? Legokonzept statt All-in-One-Lösung als Paradigmenwechsel im Anlagenbau** Hall 9.1, Room Motiv **jobvector carreer day** Hall 9.2, Discussion Corner
s	**Materials and materials testing** Corrosion resistant materials for plants and processes	**Desalination**	**Chemical control legislation in East Asia**	**Food biotech-nology** Enzymes and metabolites	**Bioprocesses** Downstream processing	**Optimisation of pharmaceutical protein production by applications of Design of Experiments and Multivariate Data Analysis**		**Development and application of novel biocatalysts** Biocatalyst development, new tools & methods	**Biorefineries and processing of renewables** Biofuels	19:00 **ACHEMA Midsummer Night** DECHEMA-Ground (registration necessary)	
s	**Laboratory and analytical techniques** High-throughput technologies	**Mixing and separation technology** Chromatography	**Solids processing** Granulation	**Plastics vs. Metal: options for plant engineering and design**	**Bioprocesses** Downstream processing – membranes	**Pharmaceutical production** Coating and crystallisation		**Development and application of novel biocatalysts** Advanced biotransformations	**New products through biotechnology** Biopolymers		10:30 **Technology Transfer Days** Hall 9.1, Room Logos/Genius 10:30 **Automation im Dialog** Portalhaus, Room Frequenz

Transport Links

Plan 2

ACHEMA 2012



Public transport:

- S-Bahn (surface rail) Lines S3, S4, S5, S6
- Underground Line U4 Bockenheimer Warte - Bornheim
- Tram 16 Offenbach - Ginnheim
  Tram 17 Rebstockbad - Hauptbahnhof
- Bus 32 Güterplatz - Ostbahnhof
  Bus 50 Höchst Bahnhof - Bockenheimer Warte

- Express bus Airport
  Entrance Galleria - Entrance Portalhaus
- Shuttle bus
- Taxi
- Tram/Bus stop
- Access to car park

Illusion 1, CMF

Plant components

Process technology, plant component procurement

Control of high pressures in chemical process engineering – 100 years of innovation
K. Jaeger, BASF SE, Ludwigshafen/D

Examples of latest developments in chlorine producing technologies
C. Schmitt, U.S. Bäumer, ThyssenKrupp Uhde GmbH, Dortmund/D

Industrial cooling water disinfection using a new procedure for water treatment with chlorine dioxide – practical experience in the Marl chemical park, Germany
G. Grund, B. Kossmann, F.-J. Peveling, Infracor GmbH, Marl/D

Improved solid heat carrier technology for processing different oil shales – test facilities and experimental results
H. Sieger, Outotec GmbH, Frankfurt/D; C. Binder, A. Orth, N. Anastasijevic, Outotec GmbH, Oberursel/D; I. Aarna, Eesti Energia AS, Tallinn/EW

Global sourcing of pressure vessels for chemical and petrochemical plants
K. Schumacher, TÜV SÜD Chemie Service GmbH, Leverkusen/D

Illusion 2, CMF

Materials and materials testing

High-throughput technologies

Keynote lecture
Accelerating chemical analysis by multiplexing
O. Trapp, University of Heidelberg/D

High-throughput optimisation of coatings using robotics and statistical experiment planning
M. Kopczynski, W. Schrof, C. Lordelot, T. Charton, BASF SE, Ludwigshafen/D

Combined use of high throughput systems for quality control and R&D
T. Burk, R. Emmerich, T. Brinz, Robert Bosch GmbH, Waiblingen/D

High throughput formulation for powders
M. Stillhammer, H. Weber, T. Brinz, Robert Bosch GmbH, Waiblingen/D

Illusion 3, CMF

BMBF – research & development for securing our raw material supply*

10:30
Welcome
L. Mennicken, Federal Ministry of Education and Research (BMBF), Berlin/D
Strategies for sustainable resource management
M. Faulstich, TU München/D

11:00
Dezincification of steel scrap
E. Gock, TU Clausthal/D

11:30
reACT – Recovery and reuse of platinum group metals from fuel cells
E. Fokkens, Hydrogen and Informatics Institute of Applied Technologies gGmbH, Schwerin/D; R. Wegner, ReMetall Drochow GmbH/D

12:00
An integrated process for innovative extraction of metals from mine dumps
G. Borg, University of Halle-Wittenberg, Halle/D; M. Du Bois, Neue Mansfelder Bergwerkschaft GmbH, Helbra/D; R. Gorny, CONMET GmbH, Aachen/D; B. Friedrich, H. Wotruba, RWTH Aachen/D; H. Morgenroth, UVR-FIA GmbH, Freiberg/D

12:30
Heterogeneous construction and demolition waste as raw material for the production of light weight aggregates
A. Schnell, University of Weimar/D; F. Splittgerber, E.S.C.H. Engineering Service Center und Handel GmbH, Unterwellenborn/D

Illusion 1, CMF

Microreaction engineering

Scale-up concept of microreactor lab results
N. Kockmann, TU Dortmund/D

Stability criteria and radial temperature profiles for microstructured reactors
M. Rupp, E. Klemm, University of Stuttgart/D

Low-cost biological and chemical micro reactors from polymer
W.K. Schomburg, K. Burlage, C. Gerhardy, RWTH Aachen/D

Flow chemistry from lab to production: shaken not stirred
G. Gasparini, R. Ashe, P. Dickson, AM Technology, Runcorn/UK

Ceramic micro reactors for highly corrosive environments
F. Meschke, ESK Ceramics GmbH & Co. KG, Kempten/D

Novel windows for thermal and light-induced processes on laboratory and production scale using micro structured reactors
F. Schael, M.-O. Piepenbrock, J. Heck, Ehrfeld Mikrotechnik BTS GmbH, Wendelsheim/D

Energy efficient photochemistry in automated microreaction plants
T. Dietrich, A. Freitag, R. Scholz, mikroglas chemtech GmbH, Mainz/D

Illusion 2, CMF

Materials and materials testing

Materials testing

Investigations on enhanced flooded batteries on the basis of the lead-acid battery for micro-hybrid applications in vehicles
E. Ebner, A. Boerger, Volkswagen AG, Wolfsburg/D; M. Wark, Ruhr-Universität Bochum/D

Spotting and mapping with a new WDXRF instrument
R. Schramm, FLUXANA GmbH & Co. KG, Bedburg-Hau/D

VDI 2083-17: new test procedure to determine comparable specific emission rates from material surfaces
M. Keller, Fraunhofer IPA, Stuttgart/D

A new centrifuge technology for efficient and reliable testing of composite strength of bonded joints and coated surfaces
U. Rietz, LUM GmbH, Berlin/D; S. Hielscher, U. Beck, BAM Federal Institute for Materials Research and Testing, Berlin/D; D. Lerche, LUM GmbH, Berlin/D

Maintenance work in sulphuric acid plants
M. Salehi, A. Hopp, STEULER-KCH GmbH, Siershahn/D

Some aspects about the kinetics and thermodynamic transformation of a special S.G. cast iron
I. Milosan, Transilvnia University of Brasov/RO

Chemical on-site-treatment of production systems made out of stainless steel
B. Henkel, M. Freybott, HENKEL Beiz- und Elektropoliertechnik GmbH u. Co. KG, Neustadt-Glewe/D

Illusion 3, CMF

Recycling and urban mining

13:30 **Plenary lecture**
cf. room Harmonie 1, CMF

14:30
Urban Mining – Besonderheiten des Recyclings metallhaltiger Werkstoffverbunde
H.-G. Jäckel, TU Bergakademie Freiberg/D

15:00
Rare earth metals from industrial by-products
G. Auer, crenox GmbH, Krefeld/D

15:30
Recycling of aluminium – improvement of the energy efficiency and optimization of secondary alloys
H. Antrekowitsch, University of Leoben/A

16:00
Chemical recycling of PET: nanostructured catalyst development and the effect of particle size on catalyst activity/selectivity
I. Muhammad, A. Waheed, H. Sajjad, King Saud University, Riyadh/SAR; K. Do Hyun, KAIST, Daejeon/ROK

16:30
Thermo-chemical processes. The green way to glass fiber reinforced plastic waste management
D. Pico, D. Lichtenwald, G. Seide, T. Gries, RWTH Aachen/D

17:00

* organised by Project Management Jülich, Forschungszentrum Jülich GmbH

Europa 1, Hall 4.0

Single-use technologies*

Concepts

10:30 **Guiding principles for the selection, validation and implementation of fluid management technologies for modern single-use aseptic processing**
J. Rumsfeld, Sartorius Stedim Biotech GmbH, Göttingen/D

11:00 **Single use bioreactors: practical aspects and critical considerations**
M. Traverse, NNE Pharmaplan, Bad Homburg/D

11:30 **Mitigating single-use implementation risks**
M. Blomberg, C. Julien, Meissner Filtration Products, Camarillo, CA/USA; Th. Vandromme, Meissner Filtration Products, Bodenheim/D

12:00 **Single-use systems for downstream processing benefits of adopting single-use TFF**
P. Nicholson, Pall Life Sciences, Portsmouth/UK; N. Pathier, H. Pora, Pall Life Sciences, St Germain en Laye/F

12:30 **Development of a disposable influenza VLP production process based on wave-mixed bag bioreactors and insect cells**
C. Ries, Zurich University of Applied Sciences (ZHAW), Wädenswil/CH; S. Wellnitz, C. John, Redbiotec AG, Schlieren/CH; R. Eibl, Zurich University of Applied Sciences (ZHAW), Wädenswil/CH

Consens, Hall 4.C

Nickel alloys, titanium and zirconium in the Chemical Process Industry*

Opening address
J. Olbrich, ThyssenKrupp VDM GmbH, Werdohl/D

Trends in the Chemical Process Industry – the integrity operating window for safe & reliable operations
M. Renner, Bayer Technology Services GmbH, Leverkusen/D

Practical experience with nickel alloys in chemical processes at DSM
J. Aerts, T. Wellauer, DSM Nutritional Products Ltd., Sisseln/CH

Overview of nickel alloys for chemical plants and their fabrication
I. Rommerskirchen, H. Butting GmbH & Co. KG, Knesebeck/D; H. Alves, ThyssenKrupp VDM GmbH, Werdohl/D

Titanium and zirconium in today's chemistry
K.-G. Schütze, Evonik-Degussa GmbH, Hanau/D

Alliance, Hall 4.C

Pharmaceutical production

Sterile production

H_2O_2 gas sterilisation of freeze dryers
R. Groß, GEA Lyophil GmbH, Hürth/D

Sterilising grade filtration in aseptic processing – options for process safety
T. Watson, Pall Life Sciences, Portsmouth/UK

Dynamic cross flow filtration system for the removal of endotoxin from aqueous solutions via ceramic membranes
S.J. Kerker, M. Ebrahimi, D. Salzig, Giessen University of Applied Sciences/D; F. Liebermann, Novoflow GmbH, Rain/D; G. Catapano, University of Calabria, Rende/I; P. Czermak, Giessen University of Applied Sciences/D

The disposables revolution – advances in single use manufacturing that enable more cost effective, environmentally friendly processing of biopharmaceuticals
N. Ross, GE Healthcare Life Sciences, Buckinghamshire/UK

Europa 1, Hall 4.0

Single-use technologies*

Processes

14:00 **Comparative studies of single-use stirred bioreactors by means of traditional methods, CFD and cultivation experiments**
S. Werner, C. Löffelholz, S.C. Kaiser, Zurich University of Applied Sciences/CH; A. Tappe, G. Greller, Sartorius Stedim Biotech GmbH, Göttingen/D; D. Eibl, Zurich University of Applied Sciences/D

14:30 **Investigations on mechanical stress caused to CHO suspension cells by standard and single-use pumps**
S. Kaiser, C. Löffelholz, N. Imseng, Zurich University of Applied Sciences/CH; W. Dornfeld, J. Burkart, Levitronix GmbH, Zurich/CH; R. Eibl, D. Eibl, Zurich University of Applied Sciences/CH

15:00 **Orbitally shaken single-use bags: engineering characterization and cell culture application examples**
S. Werner, D. Eibl, Zürcher Hochschule für Angewandte Wissenschaften (ZHAW), Wädenswil/CH; J. Olownia, D. Egger, INFORS AG, Bottmingen/CH

15:30 **Foam detection in single-use systems**
S. Zuehlke, Endress + Hauser GmbH & Co KG, Maulburg/D

16:00 **Filling systems for the future**
K. Ullherr, M. Kuchenbrod, F. Kauder, A. Belz, O. Ullmann, J. Freissmuth, M. Braeuninger, Robert Bosch GmbH, Crailsheim/D

16:30 **Next generation control platforms for bio-processing**
B. Paldus, M. Selker, Finesse Solutions, Inc., San Jose, CA/USA

17:00 **Accelerating your synthesis screening, optimisation and sample preparation work by automated, high-throughput solutions using disposable reactors**
A. Schnyder, Chemspeed Technologies AG, Augst/CH

* in cooperation with VBU – Association of German Biotechnology Companies

Consens, Hall 4.C

Nickel alloys, titanium and zirconium in the Chemical Process Industry* (continued)

Materials for chemical plants
J. Korkhaus, H.-J. Bassler, BASF SE, Ludwigshafen/D

New corrosion resistant alloys for the Chemical Process Industry
R. Behrens, ThyssenKrupp VDM GmbH, Werdohl/D

Today's applications of zirconium and titanium in the chemical industry
W. Hofmann, ASE Apparatebau GmbH, Chemnitz/D

Coffee break

Nickel alloys and their resistance to metal dusting
F. Thönnessen, Salzgitter Mannesmann Stainless Tubes GmbH, Mülheim/D; H. Hattendorf, ThyssenKrupp VDM GmbH, Werdohl/D

Standard corrosion tests and their importance for nickel alloys and high alloyed stainless steels
K. Schweier, B. Lorsbach, Bayer Technology Services GmbH, Leverkusen/D

Experience with welding of nickel alloys
T. Gräb, F. Stahl, BHR Hochdruck-Rohrleitungsbau GmbH, Essen/D

17:30 Conclusions & remarks
H. Alves, ThyssenKrupp VDM GmbH, Werdohl/D

* organised by ThyssenKrupp VDM GmbH, Werdohl/D

Alliance, Hall 4.C

Pharmaceutical production

Process and quality control

Key aspects on biotechnology and pharmaceutical technology transfer projects for regional producers for new state-of-the-art cGMP production plants – a multiple case study comparison on project examples in Russia/CIS and the Arab middle east region
D. Steinhäuser, Linde-KCA-Dresden GmbH/D

Comparison of dynamic production processes for human mesenchymal stem cells
C.L. Justice, J. Leber, P. Pino-Grace, D. Salzig, Giessen University of Applied Sciences/D; M. Kraume, TU Berlin/D; P. Czermak, Giessen University of Applied Sciences/D

Quality audits at pharmaceutical manufacturers – a quality management element for contractors, clients & authorities
H. Fabritz, NNE Pharmaplan GmbH, Bad Homburg/D

Efficient process technology is creating sustainable value through holistic and early qualification & validation
J. Eilers, Siemens Industry Software GmbH & Co. KG, Essen/D

Operational excellence for the life science industries using MES
T. Tebbe, NNE Pharmaplan GmbH, Bad Homburg/D

Managing risk in the pharmaceutical outsourcing industry
M. Giovinazzi, Janssen Pharmaceutica, Beerse/B; A. Pharaoh, Pharaoh & Co, Brussels/B

Serialization – track & trace
M. Salinas, M+W U.S., Inc., Mt. Laurel, NJ/USA

Logos/Genius, Hall 9.1

Raw materials for biotechnology: synthesis gas, lignocellulose

Submerged lignocellulose fermentations at high dry matter concentrations
J.W. van Groenestijn, TNO, Zeist/NL

Standardise and accelerate biomass pretreatment in renewables R&D by automated high-throughput and high output technologies
M. Schneider, Chemspeed Technologies AG, Augst/CH

Mechanical pretreatment of lignocellulosic biomass using a screw press
Q. Yan, M. Modigell, RWTH Aachen/D

Biotechnological potential of waste biomass
S. Kukanova, L. Zaynitdinova, T. Aripov, Academy of Sciences of the Republic of Uzbekistan, Tashkent/UZB

Esprit, Hall 9.1

German BioIndustry 2021 leading to bioeconomy*

The Cluster Biopolymers/Biomaterials: accelerating innovation processes along the value creation chain
R. Kindervater, BIOPRO Baden-Württemberg GmbH, Stuttgart/D

Biobased succinic acid
G. von Abendroth, Y. Hoelzl, BASF SE, Ludwigshafen/D; S. Theysohn, BASF Future Business GmbH, Ludwigshafen/D

ARBOCAR – Biocomposites made from lignin and other renewable resources
L. Ziegler, J. Pfitzer, H. Nägele, Tecnaro GmbH, Ilsfeld/D

Biotechnological production of fatty aldehydes
M. Buchhaupt, F. Sporleder, J. Schrader, DECHEMA e.V., Frankfurt/D

Recombinant production and processing of spider silk proteins
T. Scheibel, University of Bayreuth/D

Dialog, Hall 9.2

Biorefineries and processing of renewables

Pyrolysis/biochar

10:30 11:00 **Tandem lecture**
Biorefinery: A two step approach for producing liquid energy carriers based on lignocellulosic feed
N. Schwaiger, R. Feiner, H. Pucher, TU Graz/A; P. Pucher, BDI-Bioenergy International AG, Grambach/A; P. Wilhelm, H. Schroettner, M. Siebenhofer, TU Graz/A

11:30 **Removal of fluorides in drinking water using biochar**
D.A. Kulkarni, S.V. Agarkar, S.S. Bhagade, Anuradha Engineering College, Chikhli/IND; S.A. Mandavgane, VNIT, Nagpur/IND

12:00

12:30

Entente, Hall 4.C

Bioprocesses

Novel bioreactor concepts

Potential of orbitally shaken disposable bioreactor systems
W. Klöckner, RWTH Aachen/D; R. Gacem, Swiss Federal Institute of Technology Lausanne (EPFL)/CH; J. Büchs, RWTH Aachen/D

Cultivation of algae in novel flat panel bioreactor with high power LED light
M. Janssen, R. Bosma, P.P. Lamers, M. Cuaresma, M.J. Barbosa, R.H. Wijffels, Wageningen University and Research Centre/NL; D. Bruecher, Infors AG, Bottmingen/CH; M. Buevinc, Infors Benelux, Doetinchem/NL

Bacterial nanocellulose – continuous processing & product design
D. Kralisch, N. Hessler, University of Jena/D

A two-compartment reactor for studying impacts of inhomogeneities as appearing in industrial scale fed-batch cultivations
E. Brand, M. Baudis, I. Csiszar, S. Junne, P. Neubauer, TU Berlin/D

Improvements in fermenters/bioreactors developments in last decade – increased levels in the methodologies and recommendations in design of stainless steel sterile equipment, such as fermenters and bioreactors
D. Felezeu, Pierre Guerin Technologies, Mauze/F

Construction and development of small scale bioreactor system for cell culture cultivation processes
P. Pino Grace, D. Krienke, D. Salzig, P. Czermak, Giessen University of Applied Sciences/D

Studies on performance analysis and computer aided design of inverse fluidised bed bioreactors with nanosupport particles
C.M. Narayanan, P. Harshika, M. Tejaswi, N. Chakraborty, National Institute of Technology, Durgapur/IND

Esprit, Hall 9.1

German BioIndustry 2021 leading to bioeconomy*

Übergabe der Zuwendungsbescheide „Innovationsinitiative industrielle Biotechnologie"-BMBF

Minimized binding proteins for application in diagnostics, therapeutics and downstream processing
H. Kolmar, TU Darmstadt/D

Biocatalysis2021 – tailor made porous adsorbents for enzymatic reactions: enzyme purification, enzyme immobilization and in situ product adsorption
U. Sohling, Süd-Chemie AG, Moosburg

Cell free bioproduction of chemicals
V. Sieber, TU München/D

Biosynthesis: Opportunities for the sustainable production of chemical and pharmaceutical intermediates from biomass
T. Brück, TU München/D

Novel oxidoreductases for food and non-food applications
L. Popper, SternEnzym GmbH & Co. KG, Ahrensburg/D

Biocatalysis with unnatural enzymes
N. Budisa, TU Berlin/D

* organised by BioIndustry 2021/D

Dialog, Hall 9.2

Biorefineries and processing of renewables

Gasification of biomass

14:00 **Gasification of renewable feedstocks for the production of 2nd generation biofuels**
A. Günther, Lurgi GmbH, Frankfurt/D

14:30 **Production of ethanol from biomass-derived synthesis gas**
R. Kleinschmidt, K. Büker, ThyssenKrupp Uhde GmbH, Dortmund/D

15:00 **Tandem lecture**
The BioTfueL project
N. Ullrich, ThyssenKrupp Uhde GmbH, Dortmund/D; J.C. Viguié, Bionext, Lyon/F

15:30

16:00 **Biomass to chemicals and energy**
A. Brems, Catholic University of Leuven/B; J. Baeyens, H. Su, TU Beijing/PRC; L. Appels, R. Dewil, Catholic University of Leuven/B

16:30

17:00

Harmonie 1, CMF

Energy efficiency by integrated processes

Heat recovery – apparatus and operational aspects

10:30 **Improved energy efficiency by improved performance after retrofit of an air-cooled crude residue exchanger**
P. Drögemüller, P. Ellerby, Cal Gavin Limited, Alcester/UK

11:00 **LNG cold in an ASU cycle: thermodynamical and operational aspects**
T. Lautenschlager, Linde AG, Pullach/D

11:30 **Process design of absorption chilling machines using ionic solutions for efficient energy conservation**
S. Wang, V. Strehmel, M. Wiechalla, Niederrhein University of Applied Sciences, Krefeld/D

12:00

12:30

Harmonie 2, CMF

Safety

Theoretical investigations on industrial safety

Keynote lecture
Analysis methodology for hydrogen accident scenarios in complex industrial environments
W. Breitung, simaps GmbH, Jockgrim/D

Probability density functions of hot spots and smoke parcels in hydrocarbon pool fires
S. Schälike, BAM Federal Institute for Materials Research and Testing, Berlin/D; D. Göck, TÜV SÜD Energietechnik GmbH Baden-Württemberg, Mannheim/D; K.-D. Wehrstedt, BAM Federal Institute for Materials Research and Testing, Berlin/D; A. Schönbucher, University of Duisburg-Essen/D

Practice tool for human factor analysis
T. Dalijono, K. Löwe, Brandenburg University of Applied Science/D

Current approaches for environmental risk assessment of nanomaterials
D. Rickerby, A. Skoloudis, European Commission Joint Research Centre, Ispra/I

Harmonie 3, CMF

Solids processing

Modelling and experiment

Experimental and numerical investigation of the bulk behaviour of wood pellets on grate systems
H. Kruggel-Emden, S. Wirtz, V. Scherer, Ruhr-Universität Bochum/D

Modelling and simulation of transport processes in porous membrane structures for melt emulsification processes
N. Hornig, U. Fritsching, University of Bremen/D

Numerical and experimental investigation of the mixing process in a continuously operated bubbling fluidised bed
J. Hold, S. Wirtz, V. Scherer, Ruhr-Universität Bochum/D

Multiscale modelling of agglomerate breakage in fluidised beds
M. Dosta, S. Antonyuk, I. Rudchenko, S. Kozhar, S. Heinrich, TU Hamburg-Harburg/D

Towards filtered drag models for the simulation of complex gas-particle systems
S. Radl, M. Girardi, S. Sundaresan, Princeton University, NJ/USA

Harmonie 1, CMF

Energy efficiency by integrated processes

Heat integration and heat recovery

14:00 13.30 Plenary lecture
Future scope of Chemical Engineering in a rapidly changing world
J.C. Schouten, TU Eindhoven/NL

14:30 **Practical heat integration analysis strategies for processes exhibiting multiple base case and batch behaviour**
D. Olsen, R. Kislig, P. Felder, B. Wellig, Lucerne University of Applied Sciences and Arts/CH

15:00 **Turn your waste heat into profits with waste heat recovery**
M. Edmén, Alfa Laval AB, Lund/S

15:30 **Improving heat recovery of retrofitting heat exchanger networks with intensified heat transfer**
M. Pan, R. Smith, I. Bulatov, University of Manchester/UK

16:00 Keynote lecture
Increased process energy efficiency through advanced heat exchanger concepts
S. Scholl, TU Braunscheig/D

16:30

17:00 **Cost optimal heat exchanger network synthesis considering practicability for industrial practice**
C. Brandt, G. Fieg, TU Hamburg-Harburg/D; X. Luo, Helmut Schmidt University, Hamburg/D; O. Engel, XRG Simulation GmbH, Hamburg/D

Harmonie 2, CMF

Safety

Experimental investigations on safety characteristics

Detailed analysis of self-ignition behaviour of combustible solids – advantages of adiabatic experiments
M. Krack, M. Nau, B. Vollbrecht, Siemens AG, Frankfurt/D

Investigations on the influence of the oxygen concentration on the flame propagation in lycopodium/air mixtures
H. Kern, K. Held, H. Raupenstrauch, Montan University Leoben/A

The influence of particle size on the explosion characteristics of dusts from waste treatment facilities
K. Held, H. Kern, H. Raupenstrauch, Montan University Leoben/A

Experimental determination of self-ignition-temperatures for chemical reactive substances by hot storage tests
G. Krause, Dr. Krause GmbH, Potsdam/D

CIWA – condensation induced water hammer
C. Urban, M. Schlüter, TU Hamburg-Harburg/D

Experimental lecture
Solutions for the safe storage and handling of hazardous materials in work areas
S. Kunkel, asecos GmbH, Gründau/D

Harmonie 3, CMF

Solids processing

Fluidised beds

13.30 Plenary lecture
cf. room Harmonie 1, CMF

Customised processing of energetic composite particles and coating of particles by fluidised bed technology
T. Heintz, A. Fuchs, C. Roßmann, K. Leisinger, H. Pontius, Fraunhofer ICT, Pfinztal/D

DEM study of particle dynamics in fluidised beds under influence of adhesion forces
S. Antonyuk, M. Dosta, S. Heinrich, TU Hamburg-Harburg/D

Agglomeration of amorphous maltodextrin beads in a lab scale fluidised bed
M. Heine, S. Antonyuk, S. Heinrich, TU Hamburg-Harburg/D; D. Dopfer, G. Niederreiter, Nestlé Research Center, Lausanne/CH; S. Palzer, Nestlé Product Technology Center, York/UK

Influence of the granulator geometry in fluidised bed agglomeration of amorphous food powders
L. Fries, S. Antonyuk, S. Heinrich, TU Hamburg-Harburg/D; D. Dopfer, G. Niederreiter, Nestlé Research Center, Lausanne/CH; S. Palzer, Nestlé Product Technology Centre, York/UK

Harmonie 4, CMF

Electrochemical technologies*

Fraunhofer battery activities
J. Tübke, Fraunhofer ICT, Pfinztal/D

Rheological investigations of electrode slurries for lithium batteries
A. Würsig, T.Tönnissen, Fraunhofer ISiT, Itzehoe/D

BMBF: AlkaSuSi – lithium-sulfur-silicon batteries for electromobility
M. Hagen, T. Berger, K. Pinkwart, J. Tübke, Fraunhofer ICT, Pfinztal/D

Rechargeable Li-oxygen batteries – chances and challenges
D. Fenske, Fraunhofer IFAM, Bremen/D

New electrolytes for redox flow batteries
T. Herr, J. Noack, P. Fischer, K. Pinkwart, J. Tübke, Fraunhofer ICT, Pfinztal/D

Spektrum, CMF

Laboratory and analytical techniques

Lab automation

Faster and better formulation: accelerating and standardising the investigation of both raw material and process space
A. Perez, Chemspeed Technologies AG, Augst/CH

Automated on-line sample preparation and analysis of free and total glycerin in biodiesel according to EN 14105 and ASTM D 6584
M. Santoro, Thermo Fisher Scientific, Rodano/I; A. Mayer, Thermo Fisher Scientific, Dreieich/D; S. Pelagatti, S. Gemme, F. Pigozzo, Thermo Fisher Scientific, Rodano/I

High precision and robust laser aerosol spectrometer for industrial applications with low maintenance
S. Friedhelm, Grimm Aerosol Technik GmbH & Co. KG, Ainring/D

Miniaturised analysis and process-monitoring technology based on free flow electrophoresis and surface enhanced Raman
H. Wackerbarth, B. Kreilein, W. Hüttner, Laser-Laboratorium Göttingen e.V./D

SiLA – laboratory automation goes plug and play
U. Syré, Infoteam-Software AG and SiLA Consortium, Stäfa/CH

Conclusio 1, CMF

Sustainable laboratories

Fume cupboards and air technology*

10:30 **Safety meets sustainability – a new modular conception of walk-in fume hoods**
H.-D. Grütering, Infracor GmbH, Marl/D

11:00 **The new European standard EN 14175-7: fume cupboards for high heat and acidic load – put into practice**
J. Liebsch, WALDNER Laboreinrichtungen GmbH & Co. KG, Wangen/D

11:30 **The influence of air temperatures onto the containment of fume cupboards – observations and numerical simulation**
B. Schubert, Tintschl BESt AG, Erlangen/D

12:00 **Innovative solutions for fume cupboards**
F. Buchholz, Köttermann GmbH & Co. KG, Uetze/Hänigsen/D

12:30 **Methods to ensure performance and energy savings using filtered fume hoods**
T. Smith, Exposure Control Technologies Inc., Cary, NC/USA; A. Averd, GFH, Boston, MA/USA

Harmonie 4, CMF

Electrochemical technologies* (continued)

Nanomaterialies for PEM electrolyser
S. Rau, Fraunhofer ISE, Freiburg/D; R. Fuentes, University of South Carolina, Columbia/USA; T. Smolinka, Fraunhofer ISE, Freiburg/D; J. Weidner, University of South Carolina, Columbia/US

Anodic oxidation of alcohols – electrochemical mechanism and (useful) side products
C. Cremers, D.Bayer, F.Jung, B. Kintzel, J. Meier, Fraunhofer ICT, Pfinztal/D

Photoelectrochromic systems
A. Georg, Fraunhofer ISE, Freiburg/D

ECM of cobalt in alkaline solution – investigation of anodic dissolution
N. Schubert, TU Dresden/D; M. Schneider, Fraunhofer IKTS, Dresden/D; A. Michaelis, TU Dresden and Fraunhofer IKTS, Dresden/D

CFRP-metallisation
A. Dietz, G.Klumpp, Fraunhofer IST, Braunschweig/D

Sensor systems for medicine and environment
H.-E. Endres, Fraunhofer EMFT, Munich/D

Gas solubilities in ionic liquids: application for separation and sensors
J. Blath, Fraunhofer IGB, Stuttgart/D; N. Baltes, Fraunhofer ICT, Pfinztal/D; T. Schiestel, Fraunhofer IGB, Stuttgart/D

*organized by Fraunhofer Electrochemistry Network

Spektrum, CMF

Management of plants and assets

IT systems and strategies

Productivity and investment protection in process control – life cycle excellence with service
J. Niemann, ABB Automation GmbH, Ratingen/D

Material management – from development via scale up to production
L. Dannemann, SI PRO GmbH, Mannheim/D

A platform connecting up manufacturing operations – a babelfish for manufacturing operations between systems
M. Auer, J. Fries, SpiraTec AG, Speyer/D

Managing change – asset information management in the chemicals industry
A. Walters, G. Cox, Bentley Systems, Inc., Exton, PA/USA

Benefits of data centric tools for as built plant documentation and asynchronous planning processes
R. Knapp, M. Imbusch, AUCOTEC AG, Hanover/D

What does an efficient and integrated quality issue and activity management system need to cover?
M. Schulz, SAP AG, Walldorf/D

Web 2.0 for process industries/manufacturing
J. Fries, M. Auer, SpiraTec AG, Speyer/D

Conclusio 1, CMF

Laboratory and analytical techniques

Advances in analytical techniques

14:00 **Modern gas chromatographic equipment design**
M. Santoro, Thermo Fisher Scientific, Rodano/I; A. Mayer, Thermo Fisher Scientific, Dreieich/D; P. Magni, F. Pigozzo, Thermo Fisher Scientific, Rodano/I

14:30 **Easy, accurate and reliable UV/Vis photometric analysis**
T. Musiol, Eppendorf AG, Hamburg/D

15:00 **Advanced analysis for pharmaceutical application using X-ray imaging, scattering and diffraction**
K. Saito, Rigaku Europe SE, Berlin/D; T. Konya, A. Kishi, A. Yamano, Y. Takeda, K. Omote, T. Kubo, Rigaku Corp., Tokyo/J

15:30 **Towards a better understanding of field flow fractionation: overview of recent computer simulations**
O. Iliev, A. Latz, T. Nagapetyan, I. Shklyar, K. Steiner, Fraunhofer ITWM, Kaiserslautern/D; C. Johann, H. Schuch, Wyatt Technology Europe GmbH, Dernbach/D

16:00 **Validation of fuel stability test method with chemiluminescence**
J. Lukito, O. van Rheinberg, H. Köhne, OWI Oel-Waerme-Institut GmbH, Herzogenrath/D

16:30 **Electrochemical measurement system for a highly sensitive H_2O_2-detection in exhaled breath condensate**
M. Decker, W. Vonau, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V. Meinsberg, Ziegra-Knobelsdorf/D; T. Rabbow, R. Wachtel, Fraunhofer IKTS, Dresden/D; R. Eichler, FILT GmbH, Berlin/D

17:00 **Development of a Raman detector for hyphenation with high-temperature liquid chromatography and isotope ratio mass spectrometry**
T. Teutenberg, S. Wiese, Institut für Energie- und Umwelttechnik e.V., Duisburg/D; B. Fischer, H. Bettermann, University of Düsseldorf/D; M. Jochmann, University Duisburg-Essen/D

* in cooperation with DIN TC "Laboratory equipment"

Conclusio 2, CMF

Adhesive bonding*

10:30 **Adhesive bonding of stainless steel alloys**
P. Geiß, TU Kaiserlautern/D

11:00 **Pre-applicable adhesives – chemical solutions for new assembling concepts**
A. Hartwig, Fraunhofer IFAM, Bremen/D

11:30 **Computer simulations of highly viscous fluids for adhesive processing as example**
H. Fricke, M. Peschka, Fraunhofer IFAM, Bremen/D

12:00 **Withstanding frequent steam sterilisation in biotechnology and endoscopic medicine: adhesive bonding technique for glass and stainless steel composites**
E. Stammen, TU Braunschweig, Aachen/D; C. Bähr, RWTH Aachen/D; S. Böhm, University of Kassel/D; K. Dilger, TU Braunschweig/D; J. Büchs, RWTH Aachen/D

12:30

Fantasie 1, CMF

Advanced reaction engineering

Advanced materials

Fast start-up with ceramic fuel cell components
M. Jahn, M. Pohl, Fraunhofer IKTS, Dresden/D

Performance characteristics of metal foams as catalytic substrates
B. Saberi, Green Twirl Energy, Ottawa/CDN; S. Saberi, Ottawa/CDN; D. Naumann, Juniper Associates, Mississauga/CDN; F. Deisel, Alantum Europe GmbH, Munich/D

Hydrofluoric acid and downstream fluorochemicals from fluosilicic acid
Y. Santa Eugenia, Buss ChemTech AG, Pratteln/CH

Electrochemical synthesis of 3,3‘,5,5‘-tetramethyl-2,2‘-biphenol on a multi-molar scale
S. Waldvogel, S. Mentizi, University of Mainz/D

SILP catalysis for the hydroformylation of mixed C4 feedstocks
R. Franke, Evonik Industries AG, Marl/D; M. Haumann, FAU Busan Campus/ROK; P. Wasserscheid, University of Erlangen-Nürnberg/D

Fantasie 2, CMF

Plant control

Plant asset management

Plant asset management in the process industry
S. Gampp, Endress+Hauser Messtechnik GmbH & Co. KG, Weil am Rhein/D

Performance benchmarking and the road map to world class manufacturing
W. Rybczynski, SAP Deutschland AG & Co. KG, Walldorf/D

Life cycle management with digital communication
S. Ochsenreither, Endress+Hauser Process Solutions AG and PROFIBUS & PROFINET International, Reinach/CH

Conclusio 2, CMF

Mixing and separation technology

Distillation: multicomponent systems and multiphase flow

14:00 **Tomographic imaging for multiphase flows**
S. Reinecke, M. Schubert, Helmholtz-Zentrum Dresden-Rossendorf/D

14:30 **Thermodynamic characterisation of multicomponent mixtures based on real components**
A. Reiter, T. Wallek, P. Mair-Zelenka, M. Siebenhofer, TU Graz/A

15:00 **Crude distillation unit optimisation during crude switching**
G. Shachnovsky, T. Cohen, R. McMurray, Modcon Systems Ltd., Acco/IL

15:30 **Conceptual process design and optimisation by modelling in combination with laboratory experiments**
S. Both, J.P. Josch, J. Strube, TU Clausthal/D

16:00 **Advanced high performance feed inlet device for mixed phases**
G. Mosca, Sulzer Chemtech Ltd., Milano/I; S. Kollinger, Sulzer Chemtech Ltd., Winterthur/CH

16:30

17:00

*organised by ProcessNet Subject Division Adhesive Technology

Fantasie 1, CMF

Advanced reaction engineering

Microreaction technology / flow chemistry

Kilogram-scale production of energetic materials in a remote-controlled microreactor plant
T. Tuercke, A. Mendl, D. Boskovic, S. Loebbecke, Fraunhofer ICT, Pfinztal/D

Micro-structured reactors and heat-exchangers for distributed energy generation, bio-fuel production and mobile heat management systems
G. Kolb, Institut für Mikrotechnik Mainz GmbH/D

SYNFLOW – innovative synthesis in continuous-flow processes for sustainable chemical production
M. Picard, G. Franciò, W. Leitner, RWTH Aachen/D

Continuous flow chemistry in fine chemical synthesis
M. Weber, G. Wille, G. Yilmaz, Sigma-Aldrich Production GmbH, Buchs/CH

Self-optimising reactions in flow chemistry
M. Poliakoff, R.A. Bourne, A.J. Parrott, R.A. Skilton, University of Nottingham/UK

Extended flexibility of smart-scale continuous flow production by the example of a flow miniplant
D. Kirschneck, Microinnova Engineering GmbH, Graz/A

A flexible flow platform for rapid screening and process scale-up utilising extreme reaction conditions
C. Wiles, Chemtrix BV, Hull/UK; H. Delissen, Chemtrix BV, Geleen/NL

Fantasie 2, CMF

Laboratory and analytical techniques

Particle and nanoparticle analysis

Keynote lecture

Overview of measurement techniques for particle size distributions in multiphase systems
J. Emmerich, S. Maaß, M. Kraume, TU Berlin/D

Dynamic image analysis opens up new possibilities in particle characterisation
G. Beckmann, Retsch Technology GmbH, Haan/D

A new versatile condensation particle counter for research and environmental monitoring
J. Spielvogel, M. Weiss, Palas GmbH, Karlsruhe/D

A new device for high speed measurements of nano particles
M. Pesch, L. Keck, G. Reischl, Grimm Aerosol Technik GmbH & Co. KG, Ainring/D

Substance-specific detection of palladium and nickel nanoparticles in the presence of a background aerosol
N. Neubauer, M. Seipenbusch, G. Kasper, Karlsruhe Institut für Technologie (KIT)/D

Ultrasonic milling and dispersing technology for nano-particles
K. Hielscher, Hielscher Ultrasonics GmbH, Teltow/D

Illusion 1, CMF

Plant components

Flanges, sealing systems, piping

Challenges for plant operators selecting gaskets in the context of environmental protection, safety and costs
H. Schroers, W.L. Gore & Associates GmbH, Putzbrunn/D

Improved reliability and extended performance with dry-gas seals
D. Casucci, G. Waring, John Crane Inc., Cranston, RI/USA

VDI guideline 2290 – reduction of emissions – requirements on the industry
M. Schaaf, AMTEC GmbH, Lauffen/D

Efficient dry running protection for gas-lubricated vessel seals with selected coatings
H.-P. Mayer, B. Borngräber, John Crane GmbH, Fulda/D

General advancements in fluoropolymer lined piping systems
D. Yanik, J. Strom, CRANE ChemPharma Flow Solutions, Resistoflex, Marion, NC/USA

Illusion 2, CMF

Materials and materials testing

Materials testing – sealings, joints and composites

Investigation of the efficiency of graphite gaskets over their life cycle
A. Will, T. Haage, Frenzelit Werke GmbH, Bad Berneck/D

Damages of PTFE expansion joints
F. Hingott, TÜV SÜD Chemie Service GmbH, Frankfurt/D

Ceramic matrix composites for wear resistant pump components
J. Braza, Greene, Tweed & Co., Kulpsville, PA/USA

Tailor-made sealing solutions for reciprocating compressors
M. Langela, STASSKOL GmbH, Stassfurt/D

Illusion 3, CMF

Desalination*

10:30 **Optimising seawater reverse osmosis system design towards better product water quality and lower cost of water**
P. Sehn, Dow Deutschland GmbH & Co. OHG, Rheinmünster/D; V. Garcia Molina, Dow Water & Process Solutions, Tarragona/E

11:00 **RO pre-treatment technologies: state of the art, trends and environmental issues**
M. Beery, G. Wozny, TU Berlin/D; J.-U. Repke, TU Bergakademie Freiberg/D

11:30 **Advanced RO pre-treatment with ultrafiltration technology**
J. Wunram, J. Peschel, P. Buchta, inge GmbH, Greifenberg/D

12:00 **Thermal desalination processes and development in the view of a changing market for water production**
J. Scharfe, INVEN Absorption GmbH, Erding/D

12:30 **First operation experience with a new solar-CSC driven MED-TVC system**
H. Müller-Holst, C. Behrle, fischer eco solutions GmbH, Achern-Fautenbach/D; J. Scharfe, INVEN Absorption GmbH, Erding/D

Illusion 1, CMF

Plant components

Pumps and valves

Energy savings by optimal pump selection
J.-U. Vogel, VSX – Vogel Software GmbH, Dresden/D

Tandem lecture
Innovative drive and control technology for fluid pumps, especially positive displacement pumps
C. Arnold, B. Freissler, ProMinent Dosiertechnik GmbH, Heidelberg/D

Micro annular gear pumps – precise liquid handling from lab to production scale
P. Adryan, HNP Mikrosysteme GmbH, Parchim/D

Cutting timescales for new product development: a chemical process pump example
B. Newton, Flowserve Corporation, Stratford upon Avon/UK; D. Whitehead, Flowserve Corporation, Newark/UK

Optimisation of a compressed air system with highly fluctuating air demand
N. Piccardo, M. Tobia, Ingersoll Rand Industrial Technologies, Vignate (MI)/I

Improvements to the diaphragm valve type for chemically aggressive slurry applications
I. James, M. Amato, CRANE ChemPharma Flow Solutions, Saunders, Cwmbran/UK

Illusion 2, CMF

Materials and materials testing

Corrosion resistant materials for plants and processes

Zirconium and Zirconium alloys for use in the production of alcohols
R. Sutherlin, ATI Wah Chang, Albany, NY/USA

Evaluation of the resistance of metallic and polymeric materials used for tanks for the transport of dangerous goods
M. Weltschev, R. Baessler, Federal Institute for Materials Research and Testing, Berlin/D

Tantalum surface alloy – a new corrosion resistant thin film technology for high temperature acids
S. Eriksen, B. Gillesberg, Tantaline A/S, Nordborg/DK

Reliable operation of geothermal plants – qualification of high performance alloys by field testing
H. Asteman, D. Jakobi, Schmidt + Clemens GmbH & Co. KG, Lindlar/D; M. Finke, Bayer Technology Services GmbH, Leverkusen/D; R. Bäßler, BAM Federal Institute for Materials Research and Testing, Berlin/D; A. Saadat, German Research Centre for Geosciences, Potsdam/D

A new application for HNS-steels as a technical and financially efficient solution for the chemical process industry
R. Ritzenhoff, Energietechnik Essen GmbH/D; R. Baden, Robert Zapp Wasserstofftechnik GmbH, Ratingen/D

Material selection for oil and gas: metals for strong H_2S acidising environments at temperatures exeeding 230°C
B. Gillesberg, Tantaline A/S, Nordborg/DK; B. Chambers, Honeywell Corrosion Solutions, Houston, TX/USA

Peculiarities of a choice corrosion-resistant materials for biotech and pharmaceutical industries
K. Tarantseva, Penza State Technological Academy/RUS; V. Pakhomov, Moscow State University of Environmental Engineering/RUS

Illusion 3, CMF

Desalination* (continued)

14:00 **Mathematical model of an industrial-scale electrodialysis unit**
R. Kodým, P. Pánek, K. Bouzek, D. Šnita, Institute of Chemical Technology Prague (ICTP)/CZ

14:30 **Membrane distillation: basic considerations and pilot applications**
J. Koschikowski, D. Winter, R. Schwantes, D. Pfeifle, F. Groß, Fraunhofer ISE, Freiburg/D; M. Rolletschek, SolarSpring GmbH, Freiburg/D

15:00 **An innovative thermal separation process based on vacuum multi-effect membrane distillation suitable for desalination**
G. Lange, memsys clearwater Pte. Ltd., Krefeld/D; W. Heinzl, memsys TEC AG, Ebersberg/D; K. Zhao, memsys clearwater Pte. Ltd., Singapore/SGP

15:30 **Wetting behavior characteristics of polymer surfaces for heat transfer**
C. Dreiser, H.-J. Bart, TU Kaiserslautern/D

16:00 **Scale formation and control of mixed salts in multiple-effect distillers**
K. Krömer, H. Glade, S. Will, University of Bremen; J. Detering, M. Essig, A. Kempter, S. Nied, G. Schürmann, BASF SE, Ludwigshafen/D

16:30 **New insights into silica scaling on RO membranes**
A. Kempter, BASF SE, Ludwigshafen/D; T. Gaedt, BASF Construction Chemicals GmbH, Trostberg/D; V. Boyko, S. Nied, BASF SE, Ludwigshafen/D

17:00 **Membrane biofouling and membrane autopsies: experiences in practice**
M. Strathmann, IWW Rheinisch-Westfälisches Institut für Wasser, Mülheim/D

* organised by Dr.-Ing. Heike Glade, University of Bremen/D

Europa 1, Hall 4.0

Application of industrial heat pumps*

Improving energy-efficiency of industrial processes

10:30 **Industrial heat pumps – an overview**
R. Jakobs, H.-J. Laue, Information Centre on Heat Pumps and Refrigeration e.V., Karlsruhe and Breuberg/D

11:00 **Industrial heat pumps in Germany – potentials, technological development and application examples**
S. Wolf, J. Lambauer, U. Fahl, M. Blesl, A. Voss, University of Stuttgart/D

11:30 **Heat pumps in industrial cleaning applications**
B. Paaske, C. Heerup, L. Reinholdt, The Danish Technological Institute (DTI), Aarhus/DK

12:00 **Heat pumps using ammonia – the megawatt range**
W. Dietrich, O. Fredrich, GEA Refrigeration Germany GmbH, Berlin/D

12:30 **Very high-temperature heat pumps applied to energy efficiency in industry**
J.L. Peureux, E. Sapora, D. Bobelin, EDF, Moret sur Loing/F

Europa 1, Hall 4.0

Chemical control legislation in East Asia

14:00 **Welcome and introduction**
W. Meier, DECHEMA e.V., Frankfurt/D

14:30 **Overview of KOREA-REACH global harmonised standards**
M. Ryu, Korea Testing & Research Institute (KTR), Seoul/ROK

15:00 **Overview of dangerous chemicals regulation in China**
C. Jinhe, National Registration Center for Chemicals (SAWS), Shandong/PRC

15:30 **Overview of chemical substance control law in Japan**
H. Mishima, Mitsubishi Chemical Medience Corporation, Tokyo/J

16:00 **Overview of Taiwan's GHS and chemical management**
J. Li, Safety and Health Technology Center (SAHTECH), Tainan City/RC

16:30 **Round Table Discussion**

17:00

* organised by IZW e.V. and IEA Heat Pump Programme

Consens, Hall 4.C

Food biotechnology

Whole cells

Viability analysis of *Lactobacillus plantarum* by flow cytometry
M. Rüger, University of Magdeburg/D; S. Weinholz, Anhalt University of Applied Sciences, Bernburg/D; M. Wassermann, VTA Pergande GmbH, Weißandt-Gölzau/D; C. Cordes, Anhalt University of Applied Sciences, Bernburg/D; U. Reichl, University of Magdeburg/D; U. Reichl, MPI for Dynamics of Complex Technical Systems, Magdeburg/D

Fixed-bed cultivations of the probiotic strain *Bacillus coagulans* for functional food applications
H. Quitmann, K. Walter, Mittelhessen University of Applied Science, Giessen/D; R. Poertner, TU Hamburg-Harburg/D; P. Czermak, Mittelhessen University of Applied Science, Giessen/D

Lactobacilli and yeasts – new ways with old friends
C. Lang, ORGANOBALANCE GmbH, Berlin/D

Production of natural aroma chemicals by microbial biotransformations
C. Clemens, J. Rabenhorst, Ostwestfalen-Lippe University of Applied Science, Lemgo/D

Production of novel beverages by fermentation of wort by edible basidiomycetes
A.K. Bosse, K. Stemme, M.A. Fraatz, University of Giessen/D; H. Quitmann, P. Czermak, Giessen University of Applied Sciences/D; H. Zorn, University of Giessen/D

Consens, Hall 4.C

Food biotechnology

Enzymes and metabolites

Keynote lecture
Novel enzymes from basidiomycetes for food biotechnology – from screening to downstream processing
H. Zorn, University of Giessen/D

Immobilisation of beta-galactosidase on membranes for process intensification
P. Jochems, Y. Satyawali, S. Van Roy, W. Doyen, L. Diels, W. Dejonghe, R. Vleeschouwers, VITO, Mol/B

Peptidases in food biotechnology
B. Kranz, T. Eisele, T. Stressler, S. Meyer, L. Fischer, University of Hohenheim, Stuttgart/D

Cost-efficient production of difficult-to-express proteins in methylotrophic yeast
M. Weniger, A. Degelmann, M. Piontek, ARTES Biotechnology GmbH, Langenfeld/D

Identification of amidases from edible mushrooms and their application in food technology
N. Eisele, D. Linke, R.G. Berger, University of Hannover/D

Entente, Hall 4.C

Bioprocesses

Cell culture processes

Process development for *Galleria mellonella* derived gloverin with insect cells
D. Druzinec, D. Salzig, Giessen University of Applied Sciences/D; A. Vilcinskas, University of Giessen and Fraunhofer IME/D; M. Kraume, TU Berlin/D; P. Czermak, Giessen University of Applied Sciences/D and Kansas State University, Manhattan, KS/USA

Development of a production process of viral particles – kinetic studies of measles virus production in vero cells
K. Weiss, D. Salzig,Giessen University of Applied Science; M.D. Mühlebach, Paul-Ehrlich-Institute, Langen/D; R. Pörtner, TU Hamburg-Harburg/D; P. Czermak, Giessen University of Applied Science

Viral vaccine production at manufacturing scale (1000 m² surface) disposable fixed-bed reactor
J.C. Drugmand, S. Dubois, Y. Dohogne, N. Havelange, J. Castillo, ATMI, Brussels/B

Quality by design (QbD): a model based approach as a platform method
C. Helling, J. Strube, TU Clausthal/D

DEM approach to model mechanical behavior of eukaryotic cells
S. Schnegas, S. Antonyuk, S. Heinrich, TU Hamburg-Harburg/D

Entente, Hall 4.C

Bioprocesses

Downstream processing

Disruption of microalgae as a first step in the recovery of intracellular metabolites
L. Garcia-Gonzalez, B. Lemmens, L. Diels, K. Elst, Flemish Institute for Technological Research, Mol/B

Downstream process development for liquid-liquid extraction in biotechnology – modelling and mini-plant technology
J. Eggersgluess, S. Both, J. Strube, TU Clausthal/D

Model based design of plant-based extraction processes
S. Both, TU Clausthal/D; J. Schenk, U. Jenelten, Firmenich SA, Genf/CH; J. Strube, TU Clausthal/D

Downstream processing of biosurfactants
A. Weber, A. May, T. Zeiner, A. Górak, TU Dortmund/D

Demulsification through the downstream processing of polyunsaturated fatty acids
H. Froehlich, B. Stanisch, J. Strube, TU Clausthal/D

Optimisation and applicability of SFO – solvent freeze out – technology in protein crystallisation
V. Díaz Borbón, J. Ulrich, University of Halle-Wittenberg/D

Screening for hydrophobic interaction chromatography conditions for downstreaming of influenza virus
T. Jarosch, M.W Wolff, U. Reichl, MPI for Dynamics of Complex Technical Systems, Magdeburg/D

Alliance, Hall 4.C

Pharmaceutical production

Continuous manufacturing and flow processes

Achieving production scale flow chemistry
B. Johnson, Alfa Laval, Tumba/S; L. Helming, Alfa Laval, Stockholm/S

Transfer of a batch fluidised bed granulation to a continuous process
K. Germer, Anhalt University of Applied Sciences, Bernburg/D; M. Zenker, M. Jacob, Glatt Ingenieurtechnik GmbH, Weimar/D; B. Wolf, Anhalt University of Applied Sciences, Bernburg/D

Industrial designs, scale-up, and use of microreactors
D.M. Roberge, Lonza AG, Visp/CH; M. Kroschel, Ehrfeld Mikrotechnik BTS GmbH, Wendelsheim/D

Bioprocess facility design – cost features
D. Estapé, M+W Group GmbH, Stuttgart/D

Heat transfer with the speed of light in the chemical & pharmaceutical industry
P. Püschner, Püschner GmbH & Co. KG, Schwanewede/D

Esprit, Hall 9.1

Development and application of novel biocatalysts

Biodegradation of cellulose, lignocellulose and starch

Application of high-throughput screening methods for the development of improved enzymes for cellulose degradation
M. Kunze, T. Schmidt, U. Commandeur, RWTH Aachen/D; R. Fischer, Fraunhofer IME, Aachen/D; J. Büchs, RWTH Aachen/D

Activity and inhibitory effects of cello-oligomers on the extremophile endoglucanase from *S. solfataricus*
B. Bonhage, A.C. Spiess, RWTH Aachen/D

Development of a membrane reactor system for bio-catalysis of lignocellulosic biomass by novel enzymes
N. Busse, Giessen University of Applied Science; M. Ruehl, H. Zorn, A. Vilcinskas, University of Giessen/D; M. Kraume, TU Berlin/D; P. Czermak, Giessen University of Applied Science/D and Kansas State University, Manhattan, KS/USA

Production of alpha-amylase by newly isolated archaeon *Halorubrum xinjiangense*
M. Moshfegh, Tehran University of Medical Sciences/IR; G.R. Zarrini, Tabriz University/IR; A.R. Shahverdi, M.A. Faramarzi, Tehran University of Medical Sciences/IR

Cellulose degrading micromycetes in bioconversion process of waste biomass of *Pistia stratiotes*
L. Zaynitdinova, S. Kukanova, J. Tashpulatov, Academy of Sciences of the Republic of Uzbekistan, Tashkent/UZB

Dialog, Hall 9.2

Biorefineries and processing of renewables

Ionic liquids

10:30 **Reaction kinetics modelling of laccase from *Trametes versicolor* in an ionic liquid – cosolvent system for lignin degradation**
N. Chen, S. Roth, H. Liu, U. Schwaneberg, A.C. Spiess, RWTH Aachen/D

11:00 **Cellulose processing in ionic liquids + CO_2 media to obtain valuable products. Analysis of the role of CO_2**
C. Jiménez, A. Navarrete, M.D. Bermejo, M.J. Cocero, University of Valladolid/E

11:30 **Application of ionic liquids for the extraction of valuable compounds from bamboo biomass**
L. Appels, B. Nys, Catholic University of Leuven/B; G. Potters, University of Antwerp/B; J. Van Impe, R. Dewil, Catholic University of Leuven/B

12:00

12:30

Alliance, Hall 4.C

Optimisation of pharmaceutical protein production by applications of Design of Experiments and Multivariate Data Analysis*

Automated DoE-procedures in a multi-bioreactor system
A. Ellert, Sartorius Stedim Biotech GmbH, Goettingen/D

Rapid development of optimised expression for recombinant pharmaceutical protein production with sequential/parallel design of experiments in a multi-bioreactor plant
J. Fricke, K. Pohlmann, N.A. Jonescheit, Hamburg University of Applied Sciences/D; B. Faber, Biomedical Primate Research Centre, Rijswijk/NL; A. Ellert, B. Joksch, Sartorius Stedim Systems GmbH, Göttingen/D; R. Luttmann, Hamburg University of Applied Sciences/D

Maximise information from bioprocess development by applying Multivariate Data Analysis and Design of Experiments
I. Lindström, Umetrics AB, Malmö/S; J. Fricke, K. Pohlmann, N.A. Jonescheit, R. Luttmann, Hamburg University of Applied Sciences, Hamburg/D

Process characterisation and optimisation of a 2-step monoclonal antibody purification process using Design of Experiments and Monte Carlo simulation
M. Ahnfelt, GE Healthcare, Uppsala/S

Optimisation of combined downstream operations in an integrated bioprocess for potential malaria vaccine production
S. Borchert, S. Martens, J. Paul, Hamburg University of Applied Sciences/D; B. Faber, Biomedical Primate Research Centre, Rijswijk/NL; R. Luttmann, G. Cornelissen, Hamburg University of Applied Sciences/D

Development of an optimised sequential production and purification process for recombinant proteins with *Pichia pastoris* in a scale-down full commercial integrated bioplant
C. Müller, K. Lögering, H. Klotz, T. Voss, G. Cornelissen, R. Luttmann, Hamburg University of Applied Sciences/D

DoE for cell culture fed batch-processes – model-based design and experimental evaluation
R. Pörtner, O. Platas-Barradas, O. Sercinoglu, TU Hamburg-Harburg/D; V. Sandig, ProBioGen AG, Berlin/D; A.-P. Zeng, TU Hamburg-Harburg /D

*organised by Prof. Dr.-Ing. R. Luttmann, Hamburg University of Applied Sciences/D

Esprit, Hall 9.1

Development and application of novel biocatalysts

Biocatalyst development, new tools & methods

Development and application of metabolic enzymes
R. Wohlgemuth, Sigma-Aldrich Chemie GmbH, Buchs/CH

Tailoring of biocatalysts for the sustainable manufacturing of high-value chemicals
A. Buthe, c-LEcta GmbH, Leipzig/D

Improvement of microbial production of building block chemicals: itaconic acid production in *Aspergillus* sp.
P. Punt, A. Li, TNO, Zeist/NL

Design rules to increase activity, thermostability and organic solvent stability of enzymes
Y. Yoo, Seoul National University/ROK

Display of recombinant proteins on the surface of *E. coli*
C. Detzel, G. Festel, R. Maas, Autodisplay Biotech GmbH, Düsseldorf/D; J. Jose, University of Münster/D

Novel instant culture media solutions facilitate high level recombinant protein and plasmid production
K. Ukkonen, BioSilta Oy, Oulu/FIN; M. Krause, TU Berlin/D; A. Neubauer, BioSilta Europe GmbH, Berlin/D; S. Junne, J. Glazyrina, TU Berlin/D; A. Vasala, BioSilta Oy, Oulu/FIN; P. Neubauer, TU Berlin/D

A new method for protein purification by crystallisation
Y. Liu, M. Pietzsch, J. Ulrich, University of Halle-Wittenberg/D

Dialog, Hall 9.2

Biorefineries and processing of renewables

Biofuels

14:00 **Keynote lecture:**
Cellulosic ethanol from agricultural residues – process development and challenges
U. Kettling, A. Koltermann, Süd-Chemie AG, Munich/D

14:30

15:00 **Second generation ethanol: a concrete reality**
G. Ghisolfi, BETA RENEWABLES SpA, Tortona/I

15:30 **Biofuels from bio-based "non-food"-resources and residues**
P. Haug, Greasoline, Oberhausen/D; V. Heil, A. Kraft, K. Meller, Fraunhofer UMSICHT, Oberhausen/D

16:00 **Power and biofuel production from micro algae – estimating potential via energy balances**
P. Schlagermann, G. Göttlicher, W. Münch, EnBW Energie Baden-Wuerttemberg AG, Karlsruhe/D

16:30 **Greenhouse gas calculation of palm oil according to the European renewable energy directive**
H. Stichnothe, F. Schuchardt, Johann Heinrich von Thünen Institute (vTI), Braunschweig/D

17:00 **Biotechnological energy conversion – situation, opportunities and research needed**
T. Bley, A. Mondschein, TU Dresden/D

	Harmonie 1, CMF	Harmonie 2, CMF	Harmonie 3, CMF
	Energy efficiency by integrated processes	**Safety**	**Solids processing**
	Energy management	**Risk identification and analysis**	**Processing**
10:30	**Comprehensive energy and environmental resource management in energy-intensive industries** G. Bieser, SAP AG, Walldorf/D	**Basics of functional safety in the process industry** W. Boll, W. Grote, Phoenix Contact Electronics GmbH, Bad Pyrmont/D	**Heat transfer in powder bulks – experimental study and advanced modelling approach –** S. Palzer, Nestle Product Technology Centre, York/UK; C. Dubois, Nestle Research Centre, Lausanne/CH; S. Heinrich, L. Fries, S. Antonyuk, TU Hamburg-Harburg/D
11:00	**Integrated energy management guarantees sustainable success in the reduction of energy costs** D. Wallerius, Endress+Hauser Messtechnik GmbH & Co. KG, Weil am Rhein/D	**Risk-based design in lyophiliser projects** M. Guttzeit, GEA Lyophil GmbH, Hürth/D	**Why microwave drying is more efficient than gas-stripping?** G. Van Vaerenbergh, GEA Pharma Systems, Wommelgem/B; H. Stahl, GEA Pharma Systems, Hürth/D
11:30	**Integration of sustainable energy sources with industrial processes** H. Seeger, Infraserv GmbH & Co. Knapsack KG, Hürth/D; A. Mülheims, Aachen University of Applied Science/D; P. Lehmacher, Infraserv GmbH & Co. Knapsack KG, Hürth/D	**Risk management of plant equipment and components via effective communication and knowledge managements** R. Schönenborn, InfraServ GmbH & Co. Knapsack KG, Hürth/D	**Radial solid loadings in a core-annulus flow operating CFB-riser studied by electrical capacitance tomography** A. Brems, Catholic University of Leuven, Heverlee/B; J. Baeyens, University of Warwick, Coventry/UK; R. Dewil, Catholic University of Leuven, Heverlee/B
12:00	**How to save energy and cost in vacuum unit preheat train design** S. Mihandoust, E. van Doorn, C.P. Hälsig, Fluor B.V., Haarlem/NL	**Analysing risk of accidents due to adenergetic effects in process industries** M. Mehandjiev, Balkan Academy of Sciences, Sofia/BG	**Model-based scale-up of impact milling** B.T. Gettelfinger, S.R. Glassmeyer, Procter & Gamble, West Chester, OH/USA; M.A. Pinto, S.K. Bermingham, Process Systems Enterprise, London/UK
12:30	**Oxidative Coupling of Methane followed by Oligomerization to Liquids (OCMOL): a process integration case study aimed at the exploitation of stranded natural gas or biogas** J.W. Thybaut, G.B. Marin, University of Ghent/B	**How to implement a risk management process facile and GMP conform** B. Gübitz, VTU Engineering GmbH, Grambach/A	**New generation three roll mills meet today's challenges** N. Kern, Buhler AG, Uzwil/CH

Harmonie 4, CMF

Mixing and separation technology

Liquid separation

Improving energy efficiency with a new generation of decanter centrifuges
T. Hartmann, J. Hermeler,
GEA Westfalia Separator Group GmbH, Oelde/D

Foam drainage analysis for an anti-foam cyclone
W. Hageraats, Dynaflow Research Group, Zoetermeer/NL;
J. Bos, Frames Separaton Technologies, Woerden/NL

Separation and screening of nanoparticles in high-speed centrifuges
L. E. Spelter, M. Konrath, Karlsruhe Institute of Technology (KIT)/D; T. Vinnay, Carl Padberg Zentrifugenbau GmbH, Lahr/D

New ways in gas liquid separation technology: dual component demisting devices
D. Egger, S. Shetti, Sulzer Chemtech Ltd., Winterthur/CH

Spektrum, CMF

Management of plants and assets

Concepts and examples

Paradigm shift in design thinking, equipment selection and project execution to meet sustainablity requirements
B. Bahrabadi, C.P. Halsig, Fluor B.V. Haarlem/NL

Main motors and drives contractor MMDC – a concept for cost reduction
V. Artelt, M. Ludwig, Siemens AG, Nuremberg/D

Demolition of a refinery site in Ingolstadt
K. Noe, Arcadis Deutschland GmbH, Stuttgart/D

Sustainable production strategies in regulated industries
J. Strube, TU Clausthal/D; R. Ditz, Merck KGaA, Darmstadt/D

Comparison of synthesis gas generation concepts for capacity enlargement of ammonia plants
J. Johanning, K. Nölker, ThyssenKrupp Uhde GmbH, Dortmund/D

Conclusio 1, CMF

Laboratory and analytical techniques

Quality management and monitoring

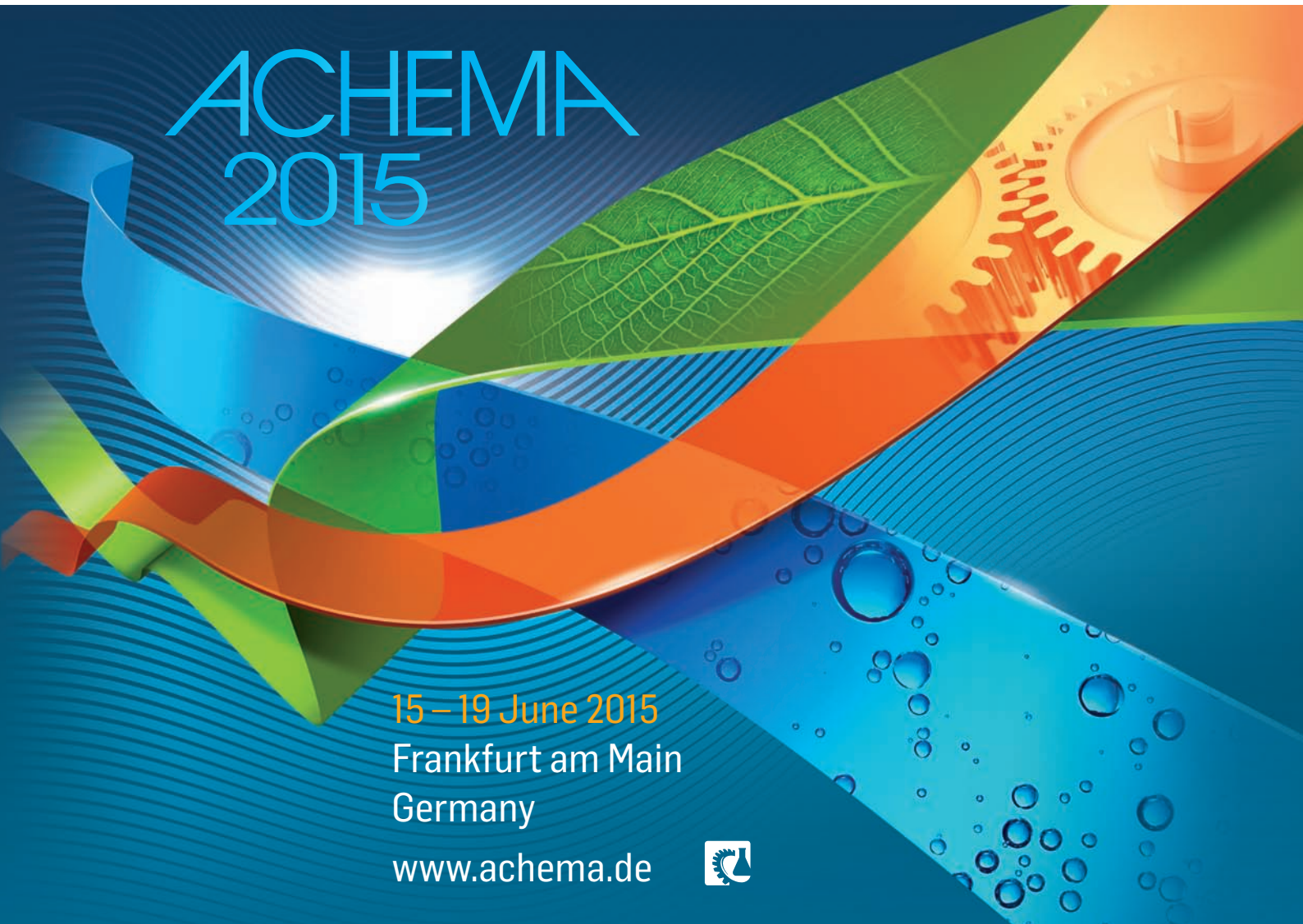
10:30 **Quality management with digital sensors in liquid analysis**
J. Nentwich, T. Alber, M. Freudenberger, T. Steckenreiter, Endress+Hauser Conducta GmbH & Co. KG, Gerlingen/D

11:00 **Monitoring of measuring equipment – avoiding mistakes between the calibration intervals of air-interface pipettes**
A. Romaguera, BRAND GmbH & Co. KG, Wertheim/D

11:30 **Measurement and control of automated pipetting systems in regulated laboratories**
B. Carle, G. Rodrigues, Artel, Westbrook, ME/USA

12:00 **Multivariate approach to laboratory analysis of powder flow properties**
T. Freeman, B. Armstrong, Freeman Technology, Malvern/UK

12:30 **Vaporized hydrogen peroxide cycle development and validation including measuring of H_2O_2 and documentation**
G. Lauth, STERIS Deutschland GmbH, Köln/D



	Conclusio 2, CMF	Fantasie 1, CMF	Fantasie 2, CMF
	Mixing and separation technology	**Reaction modelling for layout and control**	**Plant control**
	Mixing		**Field devices**
10:30	**Profitable production – an integrated approach in mixing technology** J. Jung, EKATO Rühr- und Mischtechnik GmbH, Schopfheim/D	**Model-based optimisation of enzymatic-catalysed synthesis processes** M. Schröder, G. Fieg, TU Hamburg-Harburg/D	**Energy self-sufficient pessurised air supply for application in off power grid areas** A. Riek, Festo AG & Co. KG, Esslingen/D
11:00	**About macro-mixing and micro-mixing** L. Fischer, AC Serendip AG, Walchwil/CH	**Mathematical modelling of high temperature solid oxide steam electrolysis process** P. Fischer, R. Kodým, K. Bouzek, Institute of Chemical Technology Prague/CZ	**Bubble-tight seal at -255°C** H. Hirschlein, M. Knorr, müller co-ax ag, Forchtenberg/D
11:30	**Process intensification and monitoring of liquid-liquid mixing processes** S. Maaß, M. Kraume, TU Berlin/D	**Analysis and modelling of the silica removal process of water for industrial use** N. Silva, H. Bispo, T. Gomes, Federal University of Campina Grande/BR	**The use of brushless DCV motors in electronic valve actuators** E. Carey, Flowserve Limitorque, Lynchburg, VA/USA
12:00	**Mixing and agitation in the pharma, personal care and homecare industries** C. Williams, Alfa Laval, Eastbourne/UK	**Development of technology for formic acid on Pd-containing zeolite catalysts** A.M. Aliyev, E.M. Mammadov, Q.S. Aliyev, U.A. Abasova, Azerbaijan National Academy of Sciences, Baku/AZ	**Evolution in fieldbus infrastructure** S. Sagebiel, Phoenix Contact Deutschland GmbH, Blomberg/D
12:30	**Manufacturing of high volume personal care products in a new scale of 10.000 liter batch size** A. Lukas, EKATO Systems GmbH, Schopfheim/D		**A novel encoding scheme for motion sensor signals for secured communication in process industries** S. Ananthi, R. Hariprakash, University of Madras, Chennai/IND; K. Padmanabhan, Alagappa College of Technolgy, Chennai/IND

Illusion 1, CMF	Illusion 2, CMF	Illusion 3, CMF	
Plant components	**Laboratory and analytical techniques**	**Mixing and separation technology**	
Mechanical separators, drives & motors	**High-throughput technologies**	**Chromatography**	
New development with granted patent – direct-drive pendulum roller mill PM J. Galk, Neuman & Esser GmbH, Übach-Palenberg/D	**Flexible systems for high throughput experimentation for product development and testing** W. Zinsser, Zinsser Analytic GmbH, Frankfurt/D	**Hydrodynamic and separation in continuous annular electro-chromatography** R. Laskowski, H.-J. Bart, TU Kaiserslautern/D; H. Gruber-Wölfler, P. Feenstra, M.-G. Braunbruck, J. Khinast, TU Graz/A; B. Werner, C. Hofmann, G. Menges, I. Frese, P. Löb, IMM – Institute for Microtechnik Mainz GmbH/D	10:30
Condition based maintenance for high speed separators and decanters M. Jatéus, Alfa Laval, Tumba/S	**Standardising and accelerating analytical sample preparation – flexible, easy, and rugged** M. Schneider, Chemspeed Technologies AG, Augst/CH	**IgM purification on a novel mixed-mode chromatographic resin** M. Snyder, X. He, J. Li, H. Chen, R. Frost, Bio-Rad Laboratories, Hercules, CA/USA	11:00
Energy-efficient drives for use in explosion-proof areas G. Dietz, SEW-EURODRIVE GmbH & Co. KG, Bruchsal/D	**Selecting (green) surfactants for emulsions, by combining HLD-NAC theory, its modelling software and high throughput screening** S. van Loon, VLCI, Amsterdam/NL	**Material by design for liquid chromatography** N. Kruse, W. Oppermann, C. Helling, J.P. Josch, TU Clausthal/D; R. Ditz, Merck KGaA, Darmstadt/D; J. Strube, TU Clausthal/D	11:30
	Rapid cell line selection and process development using design of experiments (DoE), quality by design and small scale bioreactor technologies T. Rau, Pall Corporation, Port Washington, NY/USA; L. Chew, T.R. Bruck, Pfenex Inc., San Diego, CA/USA	**Keynote lecture** **Perspectives of chromatography in sustainable process design – from Tswett to bioprocessing** K.K. Unger, Seeheim-Jugenheim/D; R. Ditz, Merck KGaA, Darmstadt/D	12:00
	Multiparametric cell-based sensor system for the monitoring of toxic pollutants in air U. Bohrn, M. Fleischer, Siemens AG, Munich/D; M. J. Schöning, FH Aachen, Jülich/D; P. Wagner, Hasselt University, Diepenbeek/B		12:30

	Europa 1, Hall 4.0	Consens, Hall 4.C	Entente, Hall 4.C
	Solids processing	**Plastics vs. metal: options for plant engineering and design**	**Bioprocesses**
	Granulation		**Downstream processing – membranes**
10:30	**Visualisation of the granular flow in granulators using a novel 3D particle tracking method** J. Neuwirth, S. Antonyuk, S. Heinrich, TU Hamburg-Harburg/D; M. Jacob, Glatt Ingenieurtechnik GmbH, Weimar/D	**Hydrodynamic and mass transfer properties of a new grid-structured plastic packing** V. Wolf, M. Lehner, Mining University of Leoben/A; K. Hoffmann, RVT Process Equipment GmbH, Steinwiesen/D	**Integration of membrane unit operations in biotechnology process design** H. Froehlich, F. Grote, J. Strube, TU Clausthal/D
11:00	**Continuous high shear granulation of metformin** K. Schoeters, GEA Pharma Systems, Wommelgem/B; H. Stahl, GEA Pharma Systems, Hürth/D	**Safe and reliable use of plastic materials in pickling plants** P. Bergsjö, S. Römhild, K. Jacobson, J. Samuelsson, G. Bergman, Swerea KIMAB, Stockholm/S	**In-situ product recovery using pulsed diafiltration** F. Carstensen, T. Klement, J. De Sousa Andre, J. Büchs, T. Melin, M. Wessling, RWTH Aachen/D
11:30	**Spouted bed granulation and DEM modelling of hierarchically structured ceramic/polymer composites with defined properties** M.F.H. Wolff, V. Salikov, S. Antonyuk, S. Heinrich, K. Brandt, G.A. Schneider, TU Hamburg-Harburg/D; A. Schreyer, Helmholtz-Zentrum Geesthacht, Hamburg/D	**Keynote lecture** **GRP flanges for bolted flange joints – an efficient alternative to steel flanges** S. Moritz, H. Kockelmann, University of Stuttgart/D	**Large volume fermentation based products benefit from scalable modular membrane filtration technology** K. Jevons, Koch Membrane Systems, Stafford/UK; M. Awe, Koch Membrane Systems, Aachen/D
12:00			**Water recycling and harvesting of algae biomass by membrane filtration** T. De Baerdemaeker, B. Lemmens, L. Diels, W. Doyen, VITO - Flemish Institute for Technological Research, Mol/B
12:30		**Overall corrosion protection systems for surface treatment facilities (pickling plants) for the iron, steel and stainless steel industry** M. Salehi, A. Hopp, STEULER-KCH GmbH, Siershahn/D	

Alliance, Hall 4.C

Pharmaceutical production

Coating and crystallisation

Crystallisation process models for the pharmaceutical industry: efficient workflows for validation against experiments and scale-up
S. Bermingham, M. Pinto, Process Systems Enterprise Limited, London/UK

Continuous crystallisation for APIs: crystal project
R. Ashe, AM Technology, Runcorn/UK; P. Delogu, Serichim, Torviscosa/I; S. Bermingham, PSE, London/UK; G. Gasparini, AM Technology, Runcorn/UK

Investigations on the formation of hollow acicular crystals as container systems
A. Schuster, T. Stelzer, J. Ulrich, University of Halle-Wittenberg, Halle/D

Coating of pharmaceutical ingredient using crystallisation
K.S. Lee, J. Ulrich, University of Halle-Wittenberg/D

Controlled drug release with polymer coated pellets
F. Priese, B. Wolf, Anhalt University of Applied Sciences, Bernburg/D

Esprit, Hall 9.1

Development and application of novel biocatalysts

Advanced biotransformations

Metabolic engineering for parallel conversion of glucose and xylose to lactic acid as single product
A. Gronen, T. Hirth, University of Stuttgart/D; S. Rupp, S. Zibek, Fraunhofer IGB, Stuttgart/D

Stereoselective bio-transformation of (±)-epoxy fatty acids into enantiopure bioactive hydroxylactones by yeasts
L.-A. Garbe, TU Berlin/D

Enzymatic oxidation of phenols by immobilised oxidoreductases
E. Sulman, A. Sidorov, B. Tikhonov, TU Tver/RUS

Method to produce (2*S*)-alkyl-1-one compounds using enone-reduction
L. Hoppe, TU Berlin/D; E. Martinez-Rojas, VLB Berlin/D; L.A. Garbe, TU Berlin/D

The yeast *Saccharomyces cerevisiae* as platform organism for the biotechnological production of miscellaneous industrial relevant compounds
C. Lang, A. Raab, K. Pellengahr, ORGANOBALANCE GmbH, Berlin/D

Dialog, Hall 9.2

New products through biotechnology

Biopolymers

10:30 **The bioeconomy is the time for innovative SME in biocatalysts, bioprocesses and engineering**
A. Marx, CLIB2021, Düsseldorf/D

11:00 **Production of polyhydroxyalkanoates from carbon dioxide via a two-stage fermentation process by *Cupriavidus necator***
L. Garcia-Gonzalez, S. Vangeel, L. Diels, H. De Wever, W. Dejonghe, Flemish Institute for Technological Research, Mol/B

11:30 **Crystals and proteins – an attractive symbiosis in biopolymer technology**
I. Stolte, P. Frohberg, M. Pietzsch, J. Ulrich, University of Halle-Wittenberg/D

12:00 **Optimisation and process engineering for the chemo-enzymatic epoxidation of fatty acids and non-conventional plant oils**
F. Haitz, T. Hirth, University of Stuttgart/D; S. Rupp, S. Zibek, Fraunhofer IGB, Stuttgart/D

12:30 **Integrated process for lactic acid and polylactic acid**
R. Hagen, Uhde Inventa-Fischer GmbH, Berlin/D; W. Tietz, ThyssenKrupp Uhde GmbH, Leipzig/D

STUDY COURSES
FOR STUDENTS – TEACHER PROGRAMME – SCHOOL GROUPS

ACHEMA Study Courses

Monday, 18 June to Friday, 22 June 2012

Students from universities of applied sciences, universities and higher education institutions (including MSc/Diploma students) may visit ACHEMA 2012 free of charge on any day, provided they have registered in writing in advance and are accompanied by a member of their teaching staff to supervise the group at ACHEMA.

Student groups are responsible for making their own travel and accommodation arrangements during ACHEMA.

To register for the ACHEMA Study Courses, please complete the special forms available on the Internet at www.achema.de/visit → Students.

Deadline for registrations: 1 May 2012

PRACTICAL MODULE: HIGH-THROUGHPUT EXPERIMENTS FOR HIGHER EDUCATION INSTITUTIONS

The application of high-throughput methods has dramatically changed the structure of industrial R&D, in fact many areas of materials research are inconceivable without them. However, these methods cannot be said to have gained an adequate foothold in academic education. For this reason, ProcessNet is offering students a half-day training course in the framework of the ACHEMA 2012 Study Courses. In this module, various experiments will demonstrate the advantages of high-throughput methods. The experiments have been specially developed in modules for use in university laboratories and can be lent out to universities on request.

Detailed information and the registration form are provided under www.achema.de/visit → Students.

During ACHEMA, the Study Courses information counter will be located in the foyer of the Galleria Entrance.

Teachers' Information Day

Monday, 18 June 2012 13:00 h

DECHEMA House

A. Liese, TU Hamburg-Harburg
Hautcremes, Cola und Antibiotika – welche Rolle spielen hier Biologie, Chemie, Physik und Technik?

M. Schulte, Deutsche Bundesstiftung Umwelt
Introduction to the travelling exhibition „Tüten, T-Shirts und Tenside – Die Ausstellung zur Nachhaltigen Chemie“
These events will be held in German.

Continuing education event for science and technical teaching staff at secondary schools (accredited in accordance with § 65 HLbG)

In the morning and after the lectures teachers are free to visit the congress and exhibition for their own information and in preparation for a visit with a school group.

TRAVELLING EXHIBITION „T-SHIRTS, TÜTEN UND TENSIDE – DIE AUSSTELLUNG ZUR NACHHALTIGEN CHEMIE“

The travelling exhibition „T-Shirts, Tüten und Tenside – Die Ausstellung zur Nachhaltigen Chemie“ (T-shirts, plastic bags and tensides – sustainable chemistry exhibition) curated by Deutsche Bundesstiftung Umwelt is suitable for pupils aged about 13 years and upwards and is located in Hall 9.2. Documentation and further information can be found at www.t-shirts-tueten-und-tenside.de.

School Groups

Monday, 18 June to Friday, 22 June 2012

School groups from senior classes of secondary schools can visit the exhibition free of charge on any day, provided they are accompanied by their teacher and have registered in writing in advance.

INFORMATION EVENT FOR PUPILS

Tuesday, 19 June and
Wednesday, 20 June 2012 13:30 h

Forum (Level 0), Frankfurt exhibition grounds

What exactly is “the process industry”? How can you become a biotechnologist? At these one-hour information events, experts will present study and career options. Young chemists, engineers and biotechnologists will be on hand to answer pupils' questions. Registration is not required.

Registrations for the Teachers' Information Day and the School Groups programmes can be made online at www.achema.de/besuch or via

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Fax: +49 69 7564-272
E-mail: presse@dechema.de

jobvector career day

Thursday, 21 June 2012 **all day**

Hall 9.2, Stand E66

With the jobvector career day, jobvector is again organising a tried-and-tested recruiting event for scientists, engineers and technicians at ACHEMA. For over 10 years, jobvector has been bringing job applicants and HR managers from the scientific/technical area together – both at the specialised online recruitment market jobvector.de and at the jobvector career days.

Here everything revolves around specialised technical career opportunities and strategic information for applicants at all stages of their careers. HR managers of fast-growing companies look forward to your visit!
Registration is not required.

- "jobvector networking" gives you an opportunity to acquire firsthand information about career and job perspectives in a one-on-one talk with HR managers. Committed, openminded applicants can make a lasting impression while handing in a brief application. You will find new job openings of the participating companies in the run-up to the event and during the jobvector career day at www.jobvector.de/frankfurt.

- At the "jobvector forum" in Hall 9.2 companies will present themselves, providing ideas and information in a variety of talks on career choices, entry-level opportunities and career advancement. A one-on-one job interview with a follow-up analysis will point the way ahead for the next stage of your career.

- The "jobvector check" is a chance for you to have a free SWOT analysis of your application documents. An expert from a personnel agency will discuss applications indepth in small groups and advise participants how they can optimise them. Register early for a free "jobvector check" at www.jobvector.de/frankfurt. The number of places is limited.

- On all the ACHEMA days, visit the "job wall" at the jobvector career stand (Hall 9.2, Stand E66) with advertisements of open positions offered by ACHEMA exhibitors and by jobvector! The jobvector "job wall" also offers experienced professionals new perspectives for a career change. QR codes on the advertisements refer to job advertisements at jobvector.de, so that you can save interesting offers and look them up later at home. In addition, the jobvector team will be pleased to answer any questions concerning applications and the next steps to a successful career.

www.jobvector.com

Closing Colloquium

Friday, 22 June 2012 **14:00 h**
Forum, Level 0

DECHEMA GDCh

"Green Chemistry – Contributions to Sustainability"

With the publication of the work "Green Chemistry: Theory and Practice" in 1998 Paul Anastas, then a staff chemist at the US Environmental Protection Agency (EPA), today the Assistant Administrator for EPA's Office of Research and Development (ORD) and Science Advisor to the Agency, transformed wishful thinking for soft chemistry into soft chemistry with a rational, pragmatic basis. This is how the term "Green Chemistry" established itself as a groundbreaking scientific and technological approach, aligning all stages of the chemical value-added chain with the principles of sustainability. Jointly organized by DECHEMA and Gesellschaft Deutscher Chemiker (GDCh), this event is an appropriate setting for honouring the "Father of Green Chemistry" with a special award of the GDCh Wöhler Prize for Sustainable Chemistry.

Opening address:
Hans Jürgen Wernicke, Chairman of DECHEMA

Introduction and moderation:
Wolfram Koch, Executive Director of GDCh

Presentation of the Wöhler Prize:
Barbara Albert, President of GDCh

Award lecture:
The Future of Green Chemistry and Molecular Design
Paul Anastas,
EPA, Washington/USA

Lectures:
Catalyzing Chemical Reactions and Collaborations – A Way forward to "Green Chemistry"
Walter Leitner,
RWTH Aachen/Germany

Innovation and Sustainability: Contributions of the Chemical Industry
Wolfgang Plischke,
Bayer AG, Leverkusen/ Germany

Closing address:
Barbara Albert and Hans Jürgen Wernicke

Presentation of the ACHEMA 2012 Research Award to the Max Buchner Research Foundation

ICOSSE
International Certificate on Sustainable Standards for Engineering

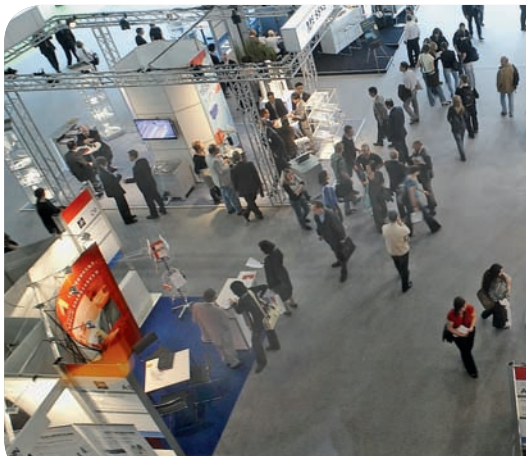
INTERNATIONAL CONGRESS ON SUSTAINABILITY, SCIENCE & ENGINEERING

Monday, 18 June 2012 **10:30–17:30 h**
CongressCenter Messe Frankfurt (CMF),
Room Illusion 3

The ICOSSE congress provides a common platform for practitioners of various physical and ecological sciences, engineering fields, economics, and social sciences to exchange emerging ideas about ways and means of protecting the environment and its resources. The central objective of the ICOSSE Initiative is to contribute to a future in which man can achieve sustained economic growth and societal benefits across the generations. The focus of this congress is on managing natural resources sustainably from a systems perspective using scientific and engineering innovations.

Organisers:
AIChE American Institute of Chemical Engineers
DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V.
Chair: Hank Kohlbrand, AIChE, New York/USA

The detailed programme can be found on page 19.



Chemical Leasing

Tuesday, 19 June 2012 17:30 h
CongressCenter Messe Frankfurt (CMF),
Room Harmonie 1

Global Chemical Leasing Award 2012 Ceremony

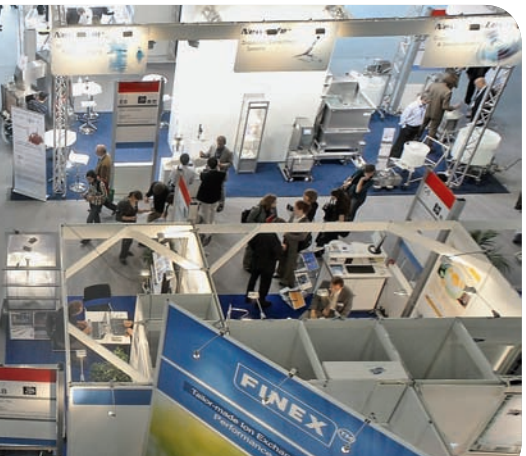
Organized by

UNIDO
lebensministerium.at
Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit

The Global Chemical Leasing Award aims to enhance the visibility of chemical leasing worldwide, encouraging innovative applications of the concept and recognizing best practices in chemical leasing implementation, science and promotional activities. The Award is conferred by the United Nations Industrial Development Organization (UNIDO), the Austrian Federal Ministry for Agriculture, Forestry, Environment and Water Management (BMLFUW) and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

Chemical Leasing is a service-based business model that promotes sustainable management of chemicals, shifting the focus from increasing the sales volume of chemicals towards a value-added approach.

The Award comprises four categories: Case studies, Consulting services, Scientific publications and Public relations (reports, media, brochures, website).



European Conference on the Bioeconomy

Wednesday, 20 June, to Thursday, 21 June 2012 10:30–17:30 h
Hall 4.0, Room Europa 2

European Innovation Partnership "The Bioeconomy": From Knowledge via Demonstration to Products and Markets

This two-day conference with high-profile speakers from European and national institutions and from industry brings together all stakeholders of the bioeconomy. The event covers the complete value chain – from the regulatory framework at EU level to the availability of feedstock and the required logistics integration of agriculture and forestry with the chemical industry, to a holistic approach to processing in biorefineries, through to conditions for a successful market launch of technologies and products. The conference will consist of five consecutive sessions:

- Towards a European bioeconomy – the framework
- Feedstock availability and the value chain
- Conversion of biomass: biorefineries
- Via demonstration to products and markets
- Innovative business models and public-private partnerships

A round-table discussion will round off the programme. The event offers a unique opportunity to discuss the contribution of the bioeconomy to industrial leadership and competitiveness and the necessary steps for its successful implementation.

www.achema.de/congress

ACHEMA Expert Round Tables

Monday, 18 June 2012 14:30 h
Hall 9.2, Discussion Corner

Implementing equipment innovations: overcoming the hen-and-egg problem
Chairman: S. Scholl, TU Braunschweig/D

Tuesday, 19 June 2012 15:00 h
Forum, Level 0

Stoffliche Nutzung von CO_2
Chairman: D. Krämer, DECHEMA e.V., Frankfurt/D

Wednesday, 20 June 2012 14:30 h
Hall 9.2, Discussion Corner

Campus Blasensäulen – verbesserte Messtechniken und Modelle zur Prozessführung und Auslegung
Chairman: M. Schlüter, TU Hamburg-Harburg/D

Wednesday, 20 June 2012 15:00 h
Forum, Level 0

Strategies for sustainable laboratories
Chairman: E. Dittrich, EGNATON e.V., Bensheim/D

Thursday, 21 June 2012 14:30 h
Forum, Level 0

Informationsplattform für Ingenieure in der Produktion
Chairman: S. Zeck, BASF SE, Ludwigshafen/D; R. Goedecke, DECHEMA e.V., Frankfurt/D

Friday, 22 June 2012 10:30 h
Hall 9.2, Discussion Corner

Flow chemistry and beyond: the future of continuous production
Chairman: N. Kockmann, TU Dortmund/D

The expert round tables will be held in the announced language.

International Powder and Nanotechnology Forum 2012

Tues., 19 June to Weds., 20 June 2012
CongressCenter Messe Frankfurt (CMF)
Room Spektrum

IPNF2012, the forum for cooperation between industry and academia and interdisciplinary exchange in the field of powder technology, is being organized with the support of The Society of Chemical Engineers, Japan (SCEJ) and DECHEMA.
We are pleased to invite ACHEMA attendees to learn more about Japan's advancements in powder technology. The forum will introduce the latest technology developed in Japan, the main focus being on porous materials, nanotechnology, interface control, crystallization, supercritical fluids, and microreactor design and operation. These key topics cover specific strengths, particularly of the Japanese process industry, ranging from the chemical and pharmaceutical sectors through to energy and environmental issues.

Organizers
Committee of the International Powder and Nanotechnology Forum 2012 (IPNF2012)
Honorary Presidents:
Y. Kawashima, Aichi Gakuin University/J
H. Emi, Kanazawa University/J
J. Ulrich, Martin Luther University of Halle-Wittenberg/D
Chairs:
H. Kamiya, Tokyo University of Agriculture and Technology/J
W. Peukert, University of Erlangen-Nuremberg/D
Co-Chairs:
M. Okawara, Okawara Kakohki Co. LTD./J
H.-J. Butt, Max Planck Institute for Polymer Research/D
M. Hartmann, University of Erlangen-Nuremberg/D
Y. Yamazaki, Nippon Chemical Industrial Co. LTD./J
Secretaries:
Y. Shirakawa, Doshisha University, Japan
H. Takiyama, Tokyo University of Agriculture and Technology, Japan

Forum Schedule
(See also pages 23 and 29)

Plenary and keynote lectures

Tuesday, 19 June 2012 13:00–17:00 h
Session 1: Pharmaceuticals, crystallization, microreactors

Wednesday, 20 June 2012 10:30–17:30 h
Session 2: Porous materials, supercritical fluids
Session 3: Fine powder and nanotechnology, colloid and interface control
Session 4: Energy and the environment
Session 5: Open discussions – future perspectives

Monday, 18 June – Friday, 22 June 2012 10:00–17:00 h
Venue: Hall 5.1, Stand D9

Panel exhibition
You will find a guide to international science and technology exchange and business opportunities for a variety of industrial sectors in a comprehensive panel exhibition.

The latest information and an updated programme will be available at www.ipnf2012.com. Attendance is open to all interested parties holding a season or day ticket for ACHEMA 2012; no additional registration is required to attend. The conference language is English.

Workshop: Chemical Control Legislation in East Asia

Thursday, 21 June 2012 14:00–17:30 h
Hall 4.0, Room Europa 1

The purpose of this workshop is to provide a platform for ACHEMA exhibitors and visitors to exchange information about chemical control legislation in East Asia. Selected speakers from renowned institutions in China, Japan, Korea and Taiwan will give an overview of the current status of legislation and its application in practice. After the lectures the speakers will be available to workshop participants for questions concerning certification procedures of their own products and services in the individual countries.
The detailed programme is on page 42.

Bionic Learning Network

Learning from nature – the SmartBird, developed by the Festo Company in the framework of its Bionic Learning Network, will be flying several times a day through the Galleria of the Frankfurt Fairgrounds during the ACHEMA week. This demonstration marks the occasion of the closing event of the series 'Bionics in Operation' on 19 June 2012. 'Bionics in Operation' forms part of the 'Hesse Nanotech' initiative of the Hesse Ministry of Economics. The SmartBird is an ultra-light bionic technology test bed, capable of taking off, flying and landing autonomously with no additional drive mechanism. The developers have thus succeeded in learning from nature by creating an energy-efficient robotic herring gull, paving the way for new approaches in automation and for optimising hybrid drive technology.

International workshop "Gases under Pressure"

A relaxed look at pressure

issa
INTERNATIONAL SOCIAL SECURITY ASSOCIATION
ASSOCIATION INTERNATIONALE DE LA SÉCURITÉ SOCIALE
ASOCIACIÓN INTERNACIONAL DE LA SEGURIDAD SOCIAL
INTERNATIONALE VEREINIGUNG FÜR SOZIALE SICHERHEIT
Section on Prevention in the Chemical Industry

The International Section on Prevention in the Chemical Industry – abbreviated to ISSA Chemistry Section – is an independent international organization and part of the International Social Security Association (ISSA). Since its foundation in 1970, it has been committed to the global prevention of occupational accidents and diseases in the chemical and related industries.
The latest health and safety issues have regularly been addressed by the working groups of the ISSA Chemistry Section at ACHEMA. In 2012 the ISSA Chemistry Section's working group "Dangerous Substances" is organizing an international workshop on the topic "Gases under Pressure" in partnership with the Swiss National Accident Insurance Fund (Suva), the French Institut National de Recherche et de Sécurité (INRS), the Austrian Social Accident Insurance Institution (AUVA) and the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI). The workshop has acquired well-known speakers from industry, the German Federal Ministry of Labour and Social Affairs, accident insurance, public authorities and the fire department.

Objective

In many industrial sectors gases under pressure are manufactured, stored, transported, handled and used in various forms. This leads to different hazards caused by the special properties of the given substance class, in particular the physical property of increased pressure. Furthermore the health of employees can be endangered, for example, by the hazards of toxic gases, by work under overpressure, or by oxygen deficiency.

In order to assess these hazards properly and to define adequate safeguards, an extensive risk analysis is required. Furthermore, important conclusions for prevention can be derived from accidents and near misses.

At this workshop the current legal requirements, their practical application as well as new aspects of safety engineering will be presented.

The ISSA Chemistry Section aims to address

- persons responsible in manufacturing and operation,
- safety engineers,
- inspectors from accident insurance institutions and government agencies,
- experts
- employees and
- representatives of employees' and employers' organisations

For all these target groups the workshop offers an international framework for a lively discussion and an exchange of ideas and experience in the city of Frankfurt. Take this opportunity to get an up-to-date overview about gases under pressure.

Venue: Franz Patat Auditorium at DECHEMA House

(directly accessible from Theodor-Heuss-Allee 25 or from the exhibition grounds)

The workshop is open to all interested parties. Attendance is only possible in conjunction with a season ticket or day ticket for ACHEMA 2012.
To register, please contact michaela.frenzel@bgrci.de.

Conference languages

All lectures and discussions will be simultaneously translated into German, English and French.

Schedule:

Wednesday, 20 June 2012 10:00 to 15:30 h

- Welcome address
- Gases under pressure: Why we need to manage the risk
- Storage of gases under pressure: Technical aspects
- Pressure equipment: Classifying and inspecting during manufacture and operation
- Working safely with gases: Risk assessment and emergency management
- Life cycle of compressed gas cylinders: Procurement, maintenance, repairs and disposal
- Safe storage of liquefied petroleum gas (LPG) in stationary storage tanks

Thursday, 21 June 2012 10:00 to 15:30 h

- Aerosol cans: Hazards and safe handling
- Precautionary measures when extinguishing burning gas
- Panel discussion oxygen-related hazards
  Protection of workers – safe working
  Testing of components and nonmetallic materials for oxygen service
- Oxygen deficiency (hypoxemia) hazards
- Working safely under pressure:
  Field experiences in occupational medicine

A detailed schedule can be found at

www.issa.int/prevention-chemistry or at www.bgrci.de. Alternatively you can contact the organizer:
ISSA Chemistry Section
c/o BG RCI
Tel.: +49 (0)6221/523-429
Fax: +49 (0)6221/523-420
E-mail: antje.ermer@bgrci.de

In conjunction with the workshop: The BG RCI exhibition stand in Hall 9.1, Stand B68

"With safety at your side – gases under pressure: know the risks!" is the focus at the stand of the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI). It offers a wide range of information and media on the topic of gases. Most of the exhibits at the stand are interactive, providing a hands-on experience and a fascinating presentation of information about the safe handling of compressed gases. From 18 to 22 June 2012, the stand will complement the exhibits with an attractive programme of events:

- Experimental lectures on the dangers of gases
- The new information portal "Gases under pressure"
- Award for the best report on gases by a trainee studying to become a specialist in occupational safety
- Guided video tours with information on individual exhibits at the stand

The BG RCI looks forward to welcoming you.

Further information is available at

www.bgrci.de or from
BG RCI
Tel.: +49/(0)6221/523-463
Fax: +49/(0)6221/523-420
E-mail: peter.guterl@bgrci.de

Meet your Friends

Monday, 18 June 2012 **from 18:00 h**

Forum, Level 0

For exhibitors, journalists and attendees

It is only a matter of a few steps from your stand to the ACHEMA launch party. Come over with your colleagues and business partners to the Forum on the exhibition grounds and join us in celebrating the start of ACHEMA 2012.

We would like to invite you to spend an evening in a relaxed party atmosphere, the perfect end to the first busy ACHEMA day!

(by special invitation)

www.achema.de/meetyourfriends

Frankfurt Evening in the Römer

Wednesday, 20 June 2012 **19:00 h**

The traditional Frankfurt Evening, held on the occasion of ACHEMA, takes place in the Römer.

The joint hosts are the City of Frankfurt am Main, Messe Frankfurt GmbH and DECHEMA.

(by special invitation of the City of Frankfurt only)

Frankfurt City Tour

Monday, 18 June 2012

Departure: approx. 13:30 h
Charge per person: € 45.–

Discover the vibrant Main metropolis on a tour of the city. A tour of the historic city centre takes you to well-known sights, such as the “Römer”, the famous St. Paul’s Church and the “Kaiserdom” (cathedral). You will then visit the Goethe House, which has been rebuilt and furnished authentically; as early as the mid-nineteenth century it was one of the very first memorials to a poet.

Return: around 17:30 h

Website of the city of Frankfurt am Main:
www.frankfurt.de
Website of the Goethe House:
www.goethehaus-frankfurt.de

Rüdesheim Tourist AG/Karl-Heinz Walter

"Ebbelwei Express" (Apple Wine Express)

Monday, 18 June 2012

Departure: 16:00 h
Charge per person: € 20,–

Experience a tram ride with a difference on the "Ebbelwei-Express"! This unique, picturesque vehicle will take you past many of Frankfurt's sightseeing attractions. Pretzels and original Frankfurt "Ebbelwei" (apple wine) or Apfelsaft (apple juice) will be served on the way to the accompaniment of typical Frankfurt music.

Return: around 18:00 h

Website of the Ebbelwei Express:
www.ebbelwei-express.com

ALL DEPARTURES FROM
the square in front of CongressCenter Messe Frankfurt (CMF)

CHARGE PER PERSON
includes statutory VAT
The price covers: coach travel and a guided tour in German and English.

Participants pay for their own food and drinks.

Please order tickets online at
www.achema.de/visit → General Programme

CANCELLATIONS:
Refunds on purchased tickets are only possible if the cancellation is made by 12.00 h the day before at the Service and Information counter in CMF (Congress-Center Messe Frankfurt). In this case a processing fee of € 10.– (incl. VAT) will be charged.

Rhine Trip

Wednesday, 20 June 2012

Departure: approx. 8:45 h
Charge per person: € 70,–

There is no better way to explore the Upper Middle Rhine Valley, a UNESCO World Heritage site with scenic monasteries, castles and ruins, than by ship!

After the boat trip through the spectacular scenery taking in the world-famous, legendary Loreley, your ship will cast anchor at the charming Rheingau town of Rüdesheim. Enjoy a view of this picturesque town with its half-timbered houses on a cable-car ride to the Niederwald Memorial close by.

Return: about 17:00 h

Website of the UNESCO World Heritage site Upper Middle Rhine Valley at:
www.welterbemittelrheintal.de
Website of Rüdesheim: www.ruedesheim.de

Rüdesheim Tourist AG/Karl-Heinz Walter

ACHEMA
Midsummer Night

Thursday, 21 June 2012 from 19:00 h
DECHEMA House

Thursday evening,
ACHEMA is drawing to a close
and it's Midsummer,
the longest day of the year.

Time to celebrate!

Join your friends and business partners in the Caribbean, then stroll with them through the Middle East and the Far East until you reach Europe. Nothing is more than a stone's throw away – and there's a surprise round every corner.

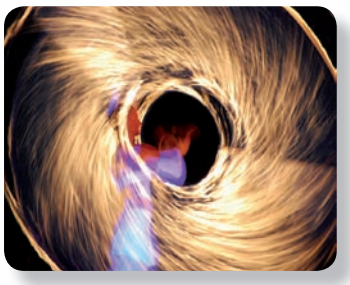
The grounds of DECHEMA, directly next to Messe Frankfurt, provide the perfect ambience for an international festivity to complement the international ACHEMA.

America

Garden

An array of marquees, samba, steel drums, fire show
Top act: Eric Prinzinger
Barbecue variations from North to South America

Directly on entering you will be transported to the **American** continent: samba dancers greet you with a welcome cocktail, steel drums and a fire show create a vibrant Caribbean setting beneath an open sky.



Asia

Entrance foyer

Acrobats and jugglers
Specialities of India and China

Do you have a weakness for **Asian** cuisine and love acrobatics? It's just a few steps up to our foyer, which will spirit you away to the magical world of the Far East.

Europe

Max Buchner Hall and Foyer

Show and dancing with a variety of artistes
and the Gail Duncan Band
Culinary tour of Europe

And just around the corner **Europe** awaits you with a variety of culinary delicacies and an elaborate show, and if the spirit moves you, you can dance the night away.

Laugh, dream and enjoy the fascination of a very special setting.

Food, drinks and unlimited entertainment are included in the ticket price of € 95.- (incl. VAT).

Numbers are limited, so make sure of your ticket in good time!

The organisers of ACHEMA look forward to welcoming you to DECHEMA House on 21 June 2012.

19:00 h	**Admission and cocktail reception**
19:30 h	**Programme starts**
	Dress: festive summerwear

For more information and registration, visit:
www.achema.de/midsummer

Tuesday, 19 June 2012

1) BASF SE, Ludwigshafen
Guided tour of the BASF company site and the visitor centre
http://besucherzentrum.basf.de
12:15–18:00 Uhr € 25.–

2) KIT – Karlsruher Institut für Technologie, Eggenstein-Leopoldshafen
Introduction to the main activities of the research institute, visit to the exhibition with examples of research activities, and a tour of several scientific and technical installations.
www.kit.edu
8:30–16:00 h € 25.–

3) Infraserv GmbH & Co. Höchst KG, Frankfurt
Guided bus tour of Industriepark Höchst with its 90 pharmaceutical, chemical and biotechnology companies
www.industriepark-hoechst.com
15:00–19:00 h € 20.–

4) Merck KGaA, Darmstadt
Presentation of Merck's research and production, insight into chemicals logistics and pharmaceutical production, "Joining Merck" – career opportunities
8:30–13:30 h € 20.–

Wednesday, 20 June 2012

5) BASF SE, Ludwigshafen
Guided tour of the BASF company site and the visitor centre
http://besucherzentrum.basf.de
12:15–18:00 h € 25.–

6) Boehringer Ingelheim Pharma GmbH & Co. KG, Ingelheim am Rhein
Infocentre (history, company figures, research), tour of the company site, LogiPackCenter (packaging)
www.boehringer-ingelheim.de
7:45–14:45 h € 20.–

7) IMM - Institut für Mikrotechnik Mainz GmbH, Mainz
Chemical process technology and engineering with microreactors, introductory presentation, guided tour of equipment and test facilities
www.imm-mainz.de
8:45–13:15 h € 20.–

8) Merck KGaA, Darmstadt
Presentation of Merck's research and production, insight into chemicals logistics and pharmaceutical production, "Joining Merck" – career opportunities
8:30–13:30 h € 20.–

Thursday, 21 June 2012

9) Infraserv GmbH & Co. Höchst KG, Frankfurt
Guided bus tour of Industriepark Höchst with its 90 pharmaceutical, chemical and biotechnology companies
www.industriepark-hoechst.com
9:00–13:15 h € 20.–

10) Deutsche Lufthansa AG, Frankfurt
Lufthansa flight training: training facilities for cockpit and cabin personnel; Lufthansa engineering: overhaul hangars with a look at some of the Lufthansa fleet; engine shops; corporate film, including a coffee break
www.lufthansa.com
8:15–13:30 h € 20.–

11) Adam Opel GmbH, Rüsselsheim
A guide will take you on a two-hour works tour and familiarise you with the many components that go into the construction of a vehicle and the individual production processes. During your visit you will be given a concise overview by visiting the press shop, body construction, final assembly, and a display of Opel's latest and vintage models.
www.opel-diewerkstour.de
9:00–13:00 h € 20.–

To join in a factory tour, please register online via www.achema.de/visit → General Programme. Your registration will be final on receipt of payment of the participation fee.

When registering, please name up to three factory tours in order of preference. Thus, if your first choice is oversubscribed, one of your other choices will be considered. More than one visit can be booked, provided there are vacancies.

The fees charged are not admission charges, but only a contribution towards expenses. Cancellations are possible at the Service and Information counter in the CMF by 12:00 h the day before the tour. A cancellation charge of € 10.- (incl. VAT) will be retained.

Participants in factory tours are required to carry a valid **identity card** or **passport**. Some companies insist on the exclusion of competitors' employees. If it is not possible for you to attend a factory tour for this reason, the participation fee will be refunded. Purchase of a factory tour ticket implies acceptance of these conditions. In case of any queries, please contact the Service and Information counter in the CMF in advance.

The tours will be held mainly in English. The tours take place at the visitor's own risk, the companies disclaim any liability. Photography is subject to permission by the organiser. The minimum age for participants is 16. Sturdy shoes are essential.

All tours will be made by coach, departing from and returning to the main entrance of the CMF (see **Exhibition Halls, Plan 1, page 31**).The times quoted refer to the departure and return times of the coaches.

Tours with insufficient bookings may be cancelled at short notice. In such cases, the participation charge will be refunded.
Subject to change.

Opening hours

Sunday, 17 June 2012

16:00 h Opening Session in Congress-Center Messe Frankfurt

Monday, 18 June to Friday, 22 June 2012

9:00 to 18:00 h for visitors
8:00 to 19:00 h for exhibitors

Admission fees

ACHEMA provides a wide range of information and services for visitors. Even if you only make a two-day visit, it is worth purchasing a season ticket since the fee includes the ACHEMA Catalogue (see page 11). All tickets entitle you to visit the exhibition and participate in the congress programme.

BENEFITS

A Visit to the exhibition
B Participation in all congress events
C ACHEMA Catalogue (see page 11)
D Participation in a factory tour – transportation costs are charged (see page 60)

All visitors to ACHEMA and their guests may attend the Opening Session with reception and the Closing Session, but these events are subject to registration and availability of places (see pages 4 and 52). Please register on the Internet at www.achema.de/visit.

Admission tickets	Fee €	Benefits included
SEASON TICKETS (not transferable)		
» for those employed in trade and industry[1)]	80.–	A, B, C, D
» for those employed in universities, public authorities, associations[2)]	60.–	A, B, C, D
» for students, pensioners, the unemployed and disabled[3)]	30.–	A, B, C, D
» for accompanying visitors (only family members, only in conjunction with a season ticket)[3)]	15.–	A, B, D
» for students, trainees, pupils, pensioners, the unemployed and disabled[3)]	15.–	A, B
DAY TICKETS		
» Day Ticket[3)]	30.–	A, B
» Reduced day ticket rate for students, trainees, pupils, pensioners, the unemployed and disabled	6.–	A, B

Registration fees incl. VAT; lost or mislaid tickets cannot be replaced.

[1)] incl. € 8.– donation to research
[2)] incl. € 6.– donation to research
[3)] incl. € 2.– donation to research

Please only order and print out full-price day and season tickets online at www.achema.de. Reduced tickets are only available on the spot at the ticket offices.

The contribution to research is requested for the Max Buchner Research Foundation, which the DECHEMA administers in an honorary capacity. It is a voluntary contribution, which is tax-deductible in Germany. The Max Buchner Research Foundation awards scholarships in support of the research areas laid down in the statutes of DECHEMA. This supplements the broad support provided by DECHEMA to industrial research.

Individual members of DECHEMA receive a discount of € 15.– off a full-price season ticket. Please order your season ticket on the Internet at www.dechema.de/mitglieder.

VISITORS' SERVICE
TICKETS – ENTRANCES – CONGRESS OFFICE

Day and Season Ticket Orders

Day and **season tickets** can be ordered on the Internet (www.achema.de → Visit).

Day and season tickets will also be on sale at the ticket offices at the entrances. Advance orders for day tickets are only possible in quantities of at least 20 tickets (orders to: tageskarten@achema.de).
Day and season tickets for students, pupils, trainees, the unemployed, handicapped persons and pensioners will only be sold at the ticket offices on the spot, subject to presentation of the relevant pass or ID.

Season tickets for persons accompanying ticket-holders can only be ordered in conjunction with a season ticket. Season tickets are issued **to family members only** and should also be ordered on the Internet.

For advance registration for **school groups**, see page 50.

Payment of day and season tickets ordered online is **by credit card** (American Express, Diners, MasterCard, VISA). On completing your order, please print out your ACHEMA ticket directly.

Cancellation
Day and season tickets are non-returnable and non-refundable.

Tickets for the General Programme

Please order tickets for the **General Programme** on the Internet (www.achema.de/visit → General Programme). Orders for events of the General Programme will be confirmed in writing; the invoice will be enclosed with the confirmation.

On receipt of the invoice, please pay the fees for the General Programme by bank transfer to DECHEMA; to avoid delays in processing the transfer, please do not fail to quote the invoice number.

Documents
All documents will be available for collection at the Congress Office in the CMF from 17 June 2012. Fees that have not been paid in advance can be paid in cash (euros) or by credit card (see above) when picking up the documents.

Entrances/Ticket Offices/Service and Information Counters

- City Entrance (tram and "U" train station "Festhalle/Messe")
- Congress Office CMF (tram and "U" train station "Festhalle/Messe")
- Torhaus ("S" train station Messe)
- Galleria (multi-storey car park and Rebstock car parks)
- Hall 3 Entrance (multi-storey car park and Rebstock car parks)
- Portalhaus (multi-storey car park and Rebstock car parks)

Services:
- day and season tickets (ticket offices)
- social events/excursions (see pages 56 ff.)
- factory tours (see page 60)
- RMV TourTickets and Frankfurt Card (see page 64)
- ACHEMA Catalogue (see page 11)
- general visitors' information
- information about DECHEMA e.V.

Reservation of accommodation can also be made at the Tourismus+Congress GmbH counters at the City Entrance and in the Service Center, Torhaus, Level 3 (see page 63). Participants in the Study Courses are requested to enquire at the "Study Courses" counter (see page 50) at the Galleria Entrance.

Congress Office until 15 June 2012
In DECHEMA House:

DECHEMA e.V.
Congresses
Theodor-Heuss-Allee 25
60486 Frankfurt am Main
Germany

Visitors' information:
E-mail: visitor@achema.de
Fax: +49 69 7564-304/-176
Tel.: +49 69 7564-167/-249

Lecture programme:
Tel.: +49 69 7564-254
E-mail: lecture@achema.de
Internet: www.achema.de → Congress

Business hours:
Mon.–Thurs. 8:30–17:00 h
Fri. 8:30–15:00 h

Congress Office from 16 June 2012
In CongressCenter Messe Frankfurt (CMF):
Tel.: +49 69 7564-249

Lecture management:
- CongressCenter Messe Frankfurt
  Tel.: +49 69 7564-254
- Hall 4.C (Foyer mezzanine)
  Tel.: +49 69 7564-152
- Hall 9
  Tel.: +49 69 7564-125

Business hours for all offices:
Daily from 8:00–18:00 h

Reservation of accommodation

Reservation of accommodation for visitors to ACHEMA 2012 is made by Tourismus+Congress GmbH Frankfurt am Main. Visitors are not charged a processing fee. Tourismus+Congress GmbH Frankfurt am Main acts only as an intermediary. The contract is between the visitor and the provider of accommodation (e.g. hotel, guesthouse, etc.). The usual business terms governing accommodation apply. The guest is responsible for payment of hotel or private accommodation not occupied or not cancelled with due notice.

Please reserve accommodation online at www.frankfurt-tourismus.de.

For inquiries, please contact
Tourismus+Congress GmbH
Frankfurt am Main
Kaiserstraße 56
60329 Frankfurt am Main
GERMANY

Tel.: +49 69 21230808
Fax: +49 69 21240512
E-mail: info@infofrankfurt.de

Offices during ACHEMA:
Torhaus, Service Center, Level 3, and at the City Entrance
Opening hours:

	Torhaus, Level 3	City Entrance
17 June:	14:00–18:00 h	closed
18 June:	8:00–18:00 h	8:00–17:00 h
19–21 June:	9:00–18:00 h	8:00–18:00 h
22 June:	10:00–14:00 h	8:00–12:00 h

Tourist Information at Frankfurt Hauptbahnhof (central station), entrance hall
Opening hours:
Monday–Friday: 8:00–21:00 h
Saturday + Sunday: 9:00–18:00 h

Changes/cancellations
Please notify Tourismus+Congress GmbH Frankfurt am Main immediately of any changes to your reservation, mentioning your reservation number. You may be charged a fee for changes or cancellations made without due notice.

Service facilities

A hall plan and a plan indicating the service facilities will be available to all visitors at the entrances.

POSTAL AND SHIPPING SERVICES
Messegelände, Torhaus, Level 3
60327 Frankfurt am Main
Germany
www.raak.de

Delivery to/pick-up from stand and hotel, postage stamps, telephone cards

Opening times:
15–17 June: 9:00–17:00 h
18–22 June: 8:30–18:00 h

before ACHEMA
Tel.: +49 69 5000000
Fax: +49 69 500000-140
E-mail: versand@raak.de

during ACHEMA
Tel.: +49 69 7575-5462
Fax: +49 69 7575-5487
E-mail: versand@raak.de

COURIER SERVICE
TNT Express GmbH
Torhaus, Service Center, Level 3
Tel.: +49 69 7575-1485
Fax: +49 69 7575-1486

BANK
Hall 4.1 Foyer
Opening times:
18–22 June: 9:00–17:00 h

CASH POINTS
- City Entrance, Level 0
- Hall 4.1, Foyer
- Torhaus Entrance, "S" train station "Messe"
- Torhaus, Service Center, Level 3 (next to the postal service)
- Galleria Entrance, Hall 9.T
- Portalhaus Entrance, Hall 11

INTERPRETER SERVICES
BBK-Gesellschaft für moderne Sprachen
Tel.: +49 7274 702770
Fax: +49 7274 702780

SHOPPING FACILITIES
City Entrance, Messe Shop, and in Torhaus, Service Center on Level 3

MEETING POINT
Galleria

CATALOGUE DISTRIBUTION
- City Entrance
- CMF
- Hall 4.1 Foyer
- Torhaus Entrance
- Galleria Entrance
- Portalhaus Entrance

OBTAINING A VISA
Foreign visitors requiring a visa to enter Germany should contact our Congress Office in good time if a personal invitation is required. You can contact the Congress Office via our Internet pages at www.achema.de under Visit → Travel information → VISA invitation or by e-mail: visa@achema.de. Under no circumstances can DECHEMA take over travel or accommodation costs.

VISITORS' SERVICE
TRANSPORT LINKS – FARE REDUCTIONS

Transport Links

See ACHEMA 2012 Plan on page 34.

BY CAR:
The multi-storey car park and the car parks in the Rebstock area are easily accessible from the motorway (day ticket multi-storey/Rebstock car parks: € 14/€ 10.–). During ACHEMA, a free shuttle bus service will operate every 5–10 minutes between these car parks and the exhibition grounds of Messe Frankfurt (Galleria, Portalhaus Hall 11, and Hall 3 entrances).
Schedule:

17.6.:	8:00–22:00 h to Tor Süd (South Gate), from 15:00 h to the Congress-Center Messe Frankfurt (CMF)
18–21 June:	7:45–23:00 h
22 June:	7:45–2:00 h (last departure, direction Rebstock)

Low-Emission Zone in Frankfurt am Main
Since October 2008 Frankfurt has a low-emission zone. From 2012 onwards all vehicles entering this zone require a green 'environmental badge' (sticker). For vehicles registered in or outside Germany, the required 'environmental badge', indicating the relevant emissions group, can be obtained at www.umwelt-plakette.de.

For vehicles **without an 'environmental badge'** access to the exhibition grounds is only possible via Tor West (West Gate) and Tor Nord (North Gate). These gates can be reached via the A648 motorway (coming from the A5) taking the "Rebstock" exit or via the Katharinenkreisel (roundabout). Messe Frankfurt's Rebstock multi-storey car park can also be reached via the "Rebstock" exit.

BY RAIL:
Frankfurt Hauptbahnhof (central railway station) is easy to reach by train. Information can be obtained at all Deutsche Bahn (DB) ticket offices, at your travel agency or on the Internet at http://www.bahn.de. Please note Deutsche Bahn AG's **event ticket**: from € 89.– from any DB station in Germany to Frankfurt am Main for ACHEMA 2012. Details are given on the website.
From Frankfurt Hauptbahnhof (central railway station) to Frankfurt Messe (exhibition grounds):

- S-Bahn (surface rail) lines S3/S4/S5/S6, departing from the underground platform 104, to Frankfurt Messe (exhibition grounds)
- Tram nos. 16 and 17 to Festhalle/Messe (exhibition grounds)
- U-Bahn (underground) line U4 (direction Bockenheimer Warte) to Festhalle/Messe (exhibition grounds)
- approx. 15 minutes' walk

BY AIR:
There are direct flights daily to Frankfurt am Main from many airports worldwide. The quickest connections between the airport and the exhibition grounds are:

- S-Bahn (surface rail) lines S8 and S9 from Regionalbahnhof (regional train station) to Hauptbahnhof (central railway station) with the RMV TourTicket
- Airport Express bus from Terminal 1 (Arrivals level, bus platform 21) via Terminal 2 (exit E) to the exhibition grounds (Galleria and Portalhaus Hall 11 entrances) and back. This link is a special service and is not included in the price of the RMV TourTicket. A single ticket costs € 7.50.

Schedule Airport → Exhibition grounds:
18–22 June:
8:00–12:00 h every 10 minutes
12:00–14:00 h every 15 minutes
Schedule Exhibition grounds → Airport:
18–22 June:
14:00 h–19:00 h every 10 minutes

Fare reductions

RMV TourTickets are a special service of DECHEMA and the public transport authority Rhein-Main-Verkehrsverbund (RMV) for exhibitors and visitors to ACHEMA 2012.

Two tickets are available:

Ticket A
Valid throughout the entire area covered by RMV (including the urban areas of Darmstadt/Erbach, Marburg/Fulda/Dillenburg, Limburg, Rüdesheim/Wiesbaden/Mainz, Hanau). Price: € 39.00*).
Ticket B
Valid only in the Frankfurt city area, including the airport. Price: € 18.60*)

Both RMV TourTickets are valid for the period 17 to 22 June 2012 (= 6 days). RMV TourTickets can be purchased at the sales outlets mentioned below. Please sign the reverse of the ticket upon receipt. RMV TourTickets are non-transferable. They entitle the holder to use the extensive RMV network (S-Bahn (surface rail), U-Bahn (underground), tram and bus*)) with its coordinated timetables. The RMV will provide additional trains for ACHEMA 2012. RMV network plans can be obtained from all ticket sales outlets.

*) does not include the special Airport Express bus

TRAVEL CARBON NEUTRAL TO ACHEMA 2012 WITH DEUTSCHE BAHN'S EVENT TICKET!
By train to ACHEMA 2012 from € 89! The prices for online bookings are fixed prices* from any station in Germany

- if limited to a **specific** train: 1st class € 149.–, 2nd class € 89.–
- **not** limited to any specific train: 1st class € 179.–, 2nd class € 119.–

This special offer entitles you to travel on all DB trains, including ICEs (Intercity Express).
The tickets are valid from 16 to 24 June 2012.
This special offer can be booked from 1 February 2012 either online or by telephone to the hotline number: +49 1805-311153**, quoting "ACHEMA" as the reference.

* Bookings must be made at least 3 days in advance. Special Offer good while supplies last. Exchanges and refunds of tickets before the first day of validity incur a cancellation fee of € 15.–; from the first day of validity onwards refunds are no longer possible.

** Telephone charges are 14 cents/min from a German Telekom landline, outside Germany the applicable phone charges apply. You can call the hotline from Monday to Saturday from 8:00 h to 21:00 h. Telephone bookings are subject to a surcharge of € 10 per ticket.

Prices are subject to change without notice. No responsibility is accepted for the correctness of this information.

FRANKFURT CARD 2012
In cooperation with Tourismus+Congress GmbH Frankfurt am Main, we additionally offer the Frankfurt Card to ACHEMA 2012 visitors. This allows free travel within the RMV network in the Frankfurt city area including the airport, and a reduction of up to 50% for a number of facilities in Frankfurt. The Frankfurt Card is available as a day ticket for € 9.20 and as a 2-day ticket for € 13.50. There is also a day ticket and a 2-day ticket for groups of max. 5 persons (€ 19/€ 28.–).

RMV TourTickets and the Frankfurt Card can be purchased at the following sales outlets:

- Frankfurt Hauptbahnhof (central station), Arrivals Hall, Tourist Information, and at the "Service and Information" counters on the exhibition grounds at
- City Entrance
- Congress Office in the CMF
- Hall 3 Entrance
- Torhaus Entrance
- Galleria Entrance
- Portalhaus Entrance

VISITORS' SERVICE

INDIVIDUAL AND GROUP TRAVEL ARRANGEMENTS

Contact addresses are available in the following countries:

ARGENTINA
Mr Guillermo Schiaffino
Secontur Lufthansa City Center
C1008 AAE Buenos Aires
Tel.: +54 11 43211000
E-mail:
feriasyexpo@seconturlcc.tur.ar
www.seconturlcc.tur.ar

AUSTRALIA
Mr Bobi Icevski
Travelticket Pty Ltd.
NSW 2000 Sydney
Tel.: +61 2 92792121
E-mail: bobi@travelticket.com.au
www.travelticket.com.au

BRAZIL
Mr Célio Larrubia
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www.lufthansacc.com.br

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www.fairtravel.cz

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http://aegypten.ahk.de

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www.cwtmeetingsevents.fr/fr/me/fr/
expertise/salon-professionnel/

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Mr Tejas Joshi
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Suite# 208/209, 2nd Floor
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Lower Parel (West)
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www.yatra.com

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Travel agents and contact addresses in other countries are available on the Internet at www.achema.de/visit → Travel Information.

Be informed. Be inspired. Be there.

Frankfurt am Main · 18 – 22 June 2012

www.achema.de

+++ 4,000 exhibitors from 50 countries +++
+++ 180,000 participants from 100 countries +++
+++ 30,000 executives +++
+++ 140,000 m² exhibition space +++
+++ 900 lectures +++

ACHEMA 2012