Working Group on Industry and Business
Arbeitskreis Industrie und Wirtschaft (AIW)

Hans-Georg Grothues
Chairman of the AIW
hg.grothues@dlr.de

The Industry Day will be held as part of the DPG Spring Conference, which usually has over 6,000 participants. Around 250 people (mostly students and doctoral candidates) taking part in the Industry Day, which is organized and carried out by the Industry and Economy Working Group (AIW) of the DPG. The aim of the events is to inspire students and PhD candidates for careers in business and industry. Following the Industry Day the DPG Technology Transfer Award will be conferred.

Overview of Invited Talks and Sessions

(Lecture hall BAR/SCHÖ)

Invited Talks

AIW 1.2	Wed	14:10–14:30	BAR/SCHÖ	**From Particle Physics to Patient Care – The Evolution of Accelerator-Based Tumor Therapy in Germany** — •Andrea Denker
AIW 1.3	Wed	14:30–14:50	BAR/SCHÖ	**High Energy X-rays: Pioneering Hope and Success in Cancer Therapy** — •Stefan Scheib
AIW 1.4	Wed	14:50–15:10	BAR/SCHÖ	**A Compact Accelerator Driven Neutron Source for Industry and Medicine** — •Holger Höltermann
AIW 2.2	Wed	16:00–16:20	BAR/SCHÖ	**Accelerating Research with Particle Accelerators** — •Christoph Quitmann
AIW 2.3	Wed	16:20–16:40	BAR/SCHÖ	**Advancements in Superconductor Technology for High-Energy Accelerators and Fusion Applications** — •Klaus Schlenga
AIW 2.4	Wed	16:40–17:00	BAR/SCHÖ	**Application of Electron Accelerators for the Crosslinking of Polymers in Industry** — •Andreas Ostrowicki

Invited Talks of the joint Symposium The Sustainability Challenge: A Decade of Transformation (SYSC)

See SYSC for the full program of the symposium.

SYSC 1.1	Mon	15:00–15:30	HSZ/AUDI	**Open-Endedness and Community-Based Approaches to Sustainability Challenges** — •Hiroki Sayama
SYSC 1.2	Mon	15:30–16:00	HSZ/AUDI	**Education as a Social Tipping Element: Evidence from Climate and Physics Education Research** — •Thomas Schubatzky
SYSC 1.3	Mon	16:00–16:30	HSZ/AUDI	**Mechanistic and Material Perspectives on Enzymatic Hydrolysis of Semicrystalline Polyesters** — •Birte Höcker
SYSC 1.4	Mon	16:45–17:15	HSZ/AUDI	**Decarbonization Options for Industry** — •Uwe Riedel
SYSC 1.5	Mon	17:15–17:45	HSZ/AUDI	**Impacts of Cosmic Dust and Space Debris in the Terrestrial Atmosphere** — •John Plane

Sessions

AIW 1.1–1.5	Wed	14:00–15:30	BAR/SCHÖ	**Medical Applications – Accelerators in the Service of Health**
AIW 2.1–2.5	Wed	15:55–17:20	BAR/SCHÖ	**Medical Applications – Accelerators in the Service of Health**
AIW 3	Wed	17:20–18:00	BAR/SCHÖ	**Ceremony of the DPG Technology Transfer Award & Presentation**
AIW 4	Wed	18:00–19:30	BAR/SCHÖ	**Open Reception of the AIW for the winners**

AIW 1: Medical Applications – Accelerators in the Service of Health

Time: Wednesday 14:00–15:30 Location: BAR/SCHÖ

AIW 1.1 Wed 14:00 BAR/SCHÖ

Welcome and greeting — •Hans-Georg Grothues[1] and •John Kettler[2] — [1]Chairman of the AIW — [2]actimondo eG, Inden

Invited Talk AIW 1.2 Wed 14:10 BAR/SCHÖ

From Particle Physics to Patient Care – The Evolution of Accelerator-Based Tumor Therapy in Germany — •Andrea Denker — Helmholtz-Zentrum für Materialien und Energie, Berlin

The origins of particle therapy in Germany lay in 1998: In July, the treatment of ocular tumours with protons started in a collaboration of Helmholtz-Zentrum Berlin and Charité – Universitätsmedizin Berlin and in August clinical studies using carbon ions began at GSI Helmholtzzentrum für Schwerionenforschung. In both cases accelerators, originally built for particle physics, were used.

Now, more than 25 years later, five centres provide particle therapy for cancer treatment and more than 30000 patients have been treated in Germany. This is an excellent example of an extremely successful technology transfer from fundamental research to health care.

In parallel to routine treatment, accompanying research is on-going. This comprises, among others, new forms of beam delivery with the hope to reduce side effects while maintaining tumour control. Examples are FLASH-irradiations, where the dose is applied in a very short time, and the spatial fractionation of the irradiation, the so-called minibeam. This new irradiation forms create new challenges for the (existing and future) accelerators.

Invited Talk AIW 1.3 Wed 14:30 BAR/SCHÖ

High Energy X-rays: Pioneering Hope and Success in Cancer Therapy — •Stefan Scheib — Varian Medical Systems Imaging Lab GmbH, Zürich

Non-communicable diseases such as cancer represent one of the greatest challenges in global healthcare. Radiation therapy is a cornerstone of cancer treatment, applied in approximately 50% of all cases worldwide. This presentation will outline the fundamental principles of radiation therapy and explore the production and clinical application of high-energy X-rays within modern treatment workflows. Advances in high-energy X-ray technology have significantly contributed to improved outcomes, including enhanced tumor control and increased overall survival rates. Finally, emerging research directions in high-energy X-ray–based radiation therapy will be discussed, underscoring the promise of continued progress and success in cancer care.

Invited Talk AIW 1.4 Wed 14:50 BAR/SCHÖ

A Compact Accelerator Driven Neutron Source for Industry and Medicine — •Holger Höltermann — Bevatech GmbH, Mörfelden-Walldorf

The use of neutrons is established since decades and essential for industry, medicine, life sciences, and research. Classical neutron sources are mainly neutron generators, with low neutron flux, or research reactors and spallation sources, which are large and cost intensive installations. A cost efficient, effective, and compact neutron source with neutron yields up to 1e13 neutrons per second could bridge the gap existing. It will offer potential users either a dedicated standalone version for high demands of a single application such as BNCT or a full variable user facility.

Discussion AIW 1.5 Wed 15:10 BAR/SCHÖ

Panel discussion: Precision, Particles, Patients – The Future of Accelerator-Based Therapies — •Andrea Denker[1], •Stefan Scheib[2], •Holger Höltermann[3], and •John Kettler[4] — [1]Helmholtz-Zentrum für Materialien und Energie — [2]Varian Medical Systems Imaging Lab GmbH — [3]Bevatech GmbH — [4]actimondo eG, Inden

AIW 2: Medical Applications – Accelerators in the Service of Health

Time: Wednesday 15:55–17:20 Location: BAR/SCHÖ

AIW 2.1 Wed 15:55 BAR/SCHÖ

Find your way: Career orientation and support from the DPG — •Gabriele Becker — Advisor to the DPG Board, Bad Honnef

Invited Talk AIW 2.2 Wed 16:00 BAR/SCHÖ

Accelerating Research with Particle Accelerators — •Christoph Quitmann — RI Research Instruments, Bergisch Gladbach

Particle accelerators are fundamental for our understanding of the universe and for improving the human condition. Whether you want to understand the standard model of particle physics, sterilize surgical instruments, polymerize plastics or cure cancer, you need a particle accelerator.

Working in the design, fabrication and installation of such accelerators requires teams combining the knowledge of all fields in natural science, engineering and computer science. This team then interacts with customers from all areas of science, technology and society.

It is possibly the most fun and diverse job awaiting any curious and engaged physicist.

Invited Talk AIW 2.3 Wed 16:20 BAR/SCHÖ

Advancements in Superconductor Technology for High-Energy Accelerators and Fusion Applications — •Klaus Schlenga — Bruker Energy & Supercon Technologies, Hanau

Progress in Superconductor performance was significantly challenged and influenced by requirements for large scale physics projects. Experimental Fusion reactors and Accelerators up to LHC used superconducting magnets based on NbTi wires, while ITER Toroidal Field (TF) as well as Central Solenoid (CS) magnets use Nb3Sn wires with technologies from the 1990ies. Exploiting further progress in wire designs the LHC High Luminosity upgrade progressed to Nb_3Sn wires with 3x the performance of ITER Nb_3Sn.

Magnets for next generation Fusion reactors challenge again cost and performance of superconductors. The talk will give an overview of current status and future outlook of wire and magnet technology including High Temperature Superconductors (HTS).

Invited Talk AIW 2.4 Wed 16:40 BAR/SCHÖ

Application of Electron Accelerators for the Crosslinking of Polymers in Industry — •Andreas Ostrowicki — BGS Beta-Gamma-Service, Wiehl

The modification of polymers using electron accelerators has evolved from a specialized niche to a versatile industrial technology with applications in numerous areas. This presentation introduces the basic mechanisms and polymer classes that are best suited for radiation crosslinking. Using examples from industry, it provides an overview of established and new applications and the technical implementation of irradiation. Current research results, challenges, and technological trends are discussed.

Discussion AIW 2.5 Wed 17:00 BAR/SCHÖ

Panel discussion: Accelerating Innovation – Industrial Applications of High-Energy Physics — •Christoph Quitmann[1], •Klaus Schlenga[2], •Andreas Ostrowicki[3], and •John Kettler[4] — [1]RI Research Instruments — [2]Bruker Energy & Supercon Technologies — [3]BGS Beta-Gamma-Service — [4]actimondo eG, Inden

AIW 3: Ceremony of the DPG Technology Transfer Award & Presentation

Time: Wednesday 17:20–18:00 Location: BAR/SCHÖ

AIW 4: Open Reception of the AIW for the winners

Time: Wednesday 18:00–19:30 Location: BAR/SCHÖ