

Physics at work in Industry

Tuesday, 28.06.2022, Room E 140

Time	ID	PHYSICS AT WORK IN INDUSTRY <i>Chair: Thilo Stöferle, IBM Rüschlikon</i>
14:00	51	Introduction <i>Thilo Stöferle</i>
14:15	52	Solving complex problems as job profile <i>Diego Casadei, Cosylab Switzerland</i> After 20 years in research in the field of particles and radiation detectors for high-energy physics in laboratory and space, the author moved to industry and is now managing a small company providing engineering services. The most appealing characteristic of a physicist in both academy and industry is the ability of solving complex problems. Complexity arises from at least few among the following aspects: conceptual context, technological challenges, long duration of project, multicultural nature of project team, political, societal and/or environmental implications of the results, etc. The main difference between research and industrial work is the point of view, to be elaborated further in the presentation.
14:35	53	Commercializing enabling R&D tools for emerging display and photovoltaics technologies <i>Beat Ruhstaller, Fluxim AG, 8400 Winterthur</i> This presentation provides insights from a growing physics-based business evolving around photon, charge and heat fluxes. Fluxim AG is a provider of simulation software and measurement hardware to the display, lighting, and photovoltaics community worldwide. Fluxim's R&D tools address the needs of researchers and engineers in industrial and academic research labs for the development of emerging electronic devices and semiconducting materials. We combine expertise in numerical methods, physical modeling, software and hardware engineering and aim at boosting the R&D efforts of our customers.
14:55	54	Reliability in SiC: from chip to module level reliability issues and the impact for the industrial application <i>Elena Mengotti, ABB Schweiz AG, 5405 Baden-Dättwil</i> ABB Corporate Research, in close cooperation with varied ABB business areas, is developing the foundations for the next generation of ABB products. R&D engineers and scientists develop new technologies and products that change the way the world works and industries do business. We constantly push the limits of convention, while retaining our focus on delivering solid returns for our customers. One of the task under current scientific investigation is the reliability of wide band gap semiconductor. Optimizing the power cycling methodology, predicting the failures before they occur together with the understanding of the threshold voltage instability implication's in the field case are topics addressed in the presentation.
15:15	55	Intellectual property rights & career opportunities as a patent attorney <i>Torben Müller, BOHEST AG, 4051 Basel</i> Intellectual property rights are more important than ever in this global, highly-connected digital landscape. With all of the good the rise of the internet has done for information sharing, it has become easier for ideas to be stolen, which can be damaging to both economies and innovation. Starting with a brief overview of the different types of IP rights, this talk will focus on the career opportunities for a physicist as a patent attorney working in a unique space where law, commerce and technology all overlap. The variety of work, both in terms of clients and technology, makes being a patent attorney a particularly rewarding and intellectually stimulating profession.

15:35	56	<p style="text-align: center;">Physics in Nano- and Microfabrication</p> <p style="text-align: center;"><i>Felix Holzner, RSBG AMS, 8048 Zürich</i></p> <p>Physics plays a key role for most processes that are required for the fabrication of advanced nano- and microdevices of all kind. RSBG AMS is a group of companies offering a wide range of innovative equipment and solutions for demanding nano- and microfabrication and surface analysis processes. A few examples are shown where physics is applied to push such technologies forward.</p>
15:55	57	<p style="text-align: center;">From Physics to Management Buy In</p> <p style="text-align: center;"><i>Tobias Vancura, CO₂ Börse AG</i></p> <p>In this presentation I will give an overview of my career path through various positions in startups, multi-national corporations, moving to the US and back, and just lately running a management buy-in project and investing my own and other money in a company in Switzerland and running its daily operations. I will put particular focus on what drove me to leave one position and take on another challenge and will hopefully be able to show that there is a myriad of possibilities outside the laboratory, while still benefitting immensely from the solid education a physicist enjoyed.</p>
16:15		
16:30		Coffee Break
		<i>Chair: Thilo Stöferle, IBM Rüschlikon</i>
17:00	58	<p style="text-align: center;">Water, Steam, and Financial Markets</p> <p style="text-align: center;"><i>Christof Schmidhuber, Lendico Schweiz AG / ZHAW</i></p> <p>I briefly summarize how my education as a theoretical physicist with focus on quantum field theory and critical phenomena has influenced my subsequent work in the alternative investment industry. While developing systematic trading strategies, I stumbled across close analogies between financial markets and second-order phase transitions. This has led to a new model of financial markets as a lattice gas, in which the lattice represents the social network of investors, and the gas molecules represent shares. Combining my physics background with my industry experience in this way is not only a lot of fun, but may also lead to a deeper understanding of financial markets with new risk management applications.</p>
17:20	59	<p style="text-align: center;">From electron tubes to AI – a physicist's life in the vacuum instrumentation industry</p> <p style="text-align: center;"><i>Bernhard Andreaus, Inficon AG, LI-9496 Balzers</i></p> <p>Vacuum instrumentation enjoys an incredibly rich portfolio of applications – from monitoring the roughing pump in sausage packaging plants to controlling pressure in fusion reactors to analyzing gas composition in the most advanced semiconductor processes, spanning about 16 decades of pressure measurement and analysis, within very different environments. We would like to take you on a physicist's journey to the challenges set by the customers, and to the methods and techniques used to successfully overcome these, some of them 120 years old and still in use others requiring the latest technological insights.</p>

17:40	60	<p style="text-align: center;">Niobium thin films in superconducting multilayer flex harnesses</p> <p style="text-align: center;"><i>Samuel D'Hollosy, HighTec MC AG</i></p> <p>Modern X-ray spectrometers in telescopes employ arrays of transition edge sensors with SQUIDS at cryogenic temperatures. The growing number of sensors requires electrical interconnects with high electrical and low thermal conductivity due to the small cooling power at these mK-temperatures. The same is true for quantum computing applications where additionally HF-losses are important.</p> <p>The author's company Hightec MC AG has been developing such superconducting multilayer flex harnesses on polyimide films to meet these requirements. Along with an introduction of company's history, we present the manufacturing process of the harness and show that the stress in the Niobium thin films should be tensile to ensure product quality.</p>
18:00	61	<p style="text-align: center;">Physics in the life-science industry - the value of collaboration with academia</p> <p style="text-align: center;"><i>Christof Fattinger, ex Hoffmann La Roche</i></p> <p>We present the development of the biophysical method "focal molography" and discuss the fascinating passage from basic science to a novel bioanalytical concept. The project was propelled by insights that evolved over many years of applied research in the life-science industry. Realization of molography required basic research on a biomolecular system augmented by physics. ETH Zürich provided the ideal environment for the project. The molographic detection principle enables sensitive and reliable label-free optical biosensors. Such sensors are an invaluable tool for bioprocess monitoring and drug discovery. The project lead to the founding of the company lino Biotech AG, the provider of focal molography in the life sciences.</p>
18:20	62	<p style="text-align: center;">A physics journey through finance into quantum computing</p> <p style="text-align: center;"><i>Daniel Egger, IBM Research</i></p> <p>Physics is used at large in both industry and academia. Furthermore, the skills learnt during our university education are broadly applicable. I will present a small subset of these applications through the lens of my personal experience which includes accelerator physics, theoretical and experimental control of superconducting qubits, financial risk management, and quantum computing applications research. I will use this journey to exemplify some available career options and show how some experiences I gained in previous positions were used in a priori unrelated topics. For example, many skills learnt in physics are transposable to finance and I will show how I translated my domain expertise in finance to quantum computing.</p>
18:40		END
19:00		Postersession with Apéro