Working Group "Young DPG"
Arbeitskreis junge DPG (AKjDPG)

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The Young DPG and EPS Young Minds take the opportunity of this joint meeting to share experiences among young physicists from all over Europe. We organise an interesting program dedicated in particular to the younger participants to provide them usefull skills on the way for their future career.

Following the tradition, we invite you on Monday evening to the EinsteinSlam to experience how science and entertainement come together. Young researchers are presenting their research in 10 minutes, suitable and entertaining for a public audience – this year in English.

Another tradition continues on this meeting: the PhD symposium of the devision Magnetism and jDPG. A team of enthusiastic PhD students organised a halfday symposium about "Ultrafast spin-lattice interactions". It is aimed to require no special knowledge about this topic and is therefore suitable also for participants from different research areas.

Together with EPS Young Minds, we want to introduce you to succesful outreach activities inside Europe and beyond and we want to discuss the impact of outreach on the career path of young researchers. In the form of a workshop, we want to discuss concrete planning of outreach and education events.

The Industry Day – jointly organised with AIW and AKC – is focused on small companies and start-ups. Four economic professionals will present their enterprises and talk about the ideas which lead them to found an enterprise.

EPS Young Minds and jDPG wishes to discuss and promote career paths and opportunities of young European Physicists. For this, we organise two career events on professional paths within and beyond Academia. In the form of a discussion panel, young physicists will have the chance to engage with different speakers through a round of questions and answers. The first session will focus on academic career paths, whereas the second one offers a more diverse view on non-academic profiles.

Overview of Invited Talks and Sessions

(Lecture room E 020)

Lunch Talks organized by the AKjDPG/AKC

PSV I	Mon	13:15–13:45	HE 101	**What Counts in Public Transportation** — •Jan Sablatnig
PSV II	Mon	13:15–13:45	H 0104	**Promoting academic Cooperation: The Alexander von Humboldt Foundation** — •Dagmar Broemme
PSV III	Tue	13:15–13:45	HE 101	**Protecting Identities - as a Physicist in the Business for international Government Solutions** — •Silke Bargstädt-Franke

PSV IV	Tue	13:15–13:45	H 0104	**FET Open: the European Innovation Council's exploratory engine for research on future disruptive technologies** — •Martin Lange
PSV V	Wed	13:15–13:45	HE 101	**Physics meets optical manufacturing** — •Ulrike Fuchs
PSV VI	Wed	13:15–13:45	H 0104	**The German Research Foundation – overview and international programmes** — •Cosima Schuster
PSV VII	Thu	13:15–13:45	HE 101	**Physicists in Consulting** — •Rolf Loschek
PSV VIII	Thu	13:15–13:45	H 0104	**Funding Opportunities Provided by the German Academic Exchange Service (DAAD)** — •Holger Finken

Invited Talks

AKC 1.1	Wed	15:00–15:30	E 020	**Becoming Business Owner - an Example** — •Volker Türck
AKC 1.2	Wed	15:30–16:00	E 020	**Cameras for the physical experiments of tomorrow** — •Roman Kemmler
AKC 1.3	Wed	16:15–16:45	E 020	**From physics to adtech** — •Markus Düttmann
AKC 1.4	Wed	16:45–17:15	E 020	**Medical applications of high power laser diodes** — •Tilmann Trebst

Sessions

AKjDPG 1.1–1.3	Sun	16:00–18:30	H 0104	**Tutorial: Dynamics and Fluctuations in Economic and Financial Markets (joint session SOE/DY/TUT/AKjDPG)**
AKjDPG 2	Mon	20:00–22:00	Urania	**EinsteinSlam**
AKjDPG 3.1–3.7	Tue	9:30–13:15	H 1012	**PhD Symposium: Ultrafast spin-lattice interactions (joint session MA/AKjDPG)**
AKjDPG 4.1–4.5	Wed	9:30–12:40	E 124	**Physics for everyone - Outreach activities for young researchers**
AKjDPG 5.1–5.5	Wed	15:00–19:00	E 020	**Industry Day: One Idea Ahead (joint session AKjDPG/AKC/AIW)**
AKjDPG 6.1–6.1	Thu	9:30–11:00	E 020	**Careers in Physics: inside Academia**
AKjDPG 7.1–7.1	Thu	11:15–12:45	E 020	**Careers in Physics: outside Academia**

AKjDPG 1: Tutorial: Dynamics and Fluctuations in Economic and Financial Markets (joint session SOE/DY/TUT/AKjDPG)

Financial and economic markets display nontrivial fluctuation statistics that called attention among physicists. Methods from statistical physics have demonstrated to be able to derive stylized facts from microscopic models, to extract networks from data, and to relate multivariate economic time series to the underlying mechanisms.

Time: Sunday 16:00–18:30 Location: H 0104

Tutorial AKjDPG 1.1 Sun 16:00 H 0104

Market microstructure: dynamics of the stock markets — •Thomas Guhr — Fakultät für Physik, Universität Duisburg-Essen

At first sight, stock prices look like random walks. Indeed, Brownian motion models and related stochastic processes do a good job in describing some of the features which are empirically found in financial data. This is consistent with Fama's celebrated Efficient Market Hypothesis (EMH) which states that price changes are unpredictable. However, the closer one looks, the less reliable are those schematic models. This is so, because the way how the trading proceeds in time, i.e. the rules imposed and the ensuing dynamics, is largely ignored. Traders submit their buy and sell orders to the order book, whose content is made available to all market participants. The order flow eventually leads in a highly complex fashion to the realized prices.

Market microstructure is a quickly growing field in which economists, physicists, data scientists and mathematicians try to clarify these dynamical processes. An appealing feature, particularly for physicists, is the wealth of data available for analysis and subsequent model building. I am going to present large-scale data analysis to identify non-Markovian features. Fundamental economic reasoning as in the EMH favors Markovian models in which prices develop (apart from a deterministic drift) without memory. Sizeable memory effects could be exploited to make profit. I will present large-scale data analyses which show that there are various non-Markovian effects due to the highly complex market dynamics. Thus, there are limits to market efficiency which, furthermore, can be quantitatively identified.

Tutorial AKjDPG 1.2 Sun 16:50 H 0104

Maximum-entropy models in economics and finance — •Tiziano Squartini — IMT School for Advanced Studies Lucca, P.zza San Francesco 19, 55100 Lucca (IT)

Entropy-maximization represents the unifying concept underlying the definition of a number of methods which are now part of the discipline known as "network theory". Despite the perfect generality of this approach, a particularly fruitful application of it has been observed in disciplines like economics and finance. This tutorial will be devoted to illustrate the methodological aspects of the aforementioned approach, with particular emphasis on the definition of null models. The latter can be employed in a number of applications, ranging from pattern detection to network reconstruction: examples will be provided of both, by taking as case studies real-world systems, as the World Trade Web and the Dutch Interbank Network. The aforementioned framework also allows one to properly model fluctuations: the latter can be interpreted as errors affecting the estimation of the quantities of interest and strongly depend on the kind of constraints defining the maximization procedure. In order to illustrate how different reconstruction algorithms perform, a comparison of proposed approaches on the aforementioned real-world systems will be also carried out.

Tutorial AKjDPG 1.3 Sun 17:40 H 0104

350 years of puzzles in economics – and a solution. — •Ole Peters — London Mathematical Laboratory — Santa Fe Institute

In 1654 Fermat and Pascal puzzled over a gambling problem and invented probability theory. Three years later, Huygens declared that random quantities and their expectation values are "the same thing." Economics was the first adopter of the budding theory and to this day maintains much of the spirit of Huygens's early proclamation. Problems arising from this view of randomness have led to numerous puzzles in economic theory and beyond. An early example is the St. Petersburg paradox of 1713, a recent example is the insurance puzzle in general competitive equilibrium theory.

Economics has responded to these puzzles largely with labels. Humans are labelled irrational or risk averse.

An alternative treatment emerged from physics, where randomness entered in the 1850s with the development of statistical mechanics. Here, the question of ergodicity arose: are expectation values indicative of temporal behavior? The insight that in many cases an expectation value does not reflect the dynamics can be used to resolve the class of economics puzzles I will discuss. It leads to an alternative economic formalism that makes testable predictions. It can answer economic questions by assessing systemic stability where previously only moral assessments were available.

More at https://ergodicityeconomics.com/lecture-notes/

AKjDPG 2: EinsteinSlam

The traditional EinsteinSlam at the SKM Spring Meeting takes place on Monday evening as usual. All participants are invited to leave the campus and come to the Urania (An der Urania 17). The slam starts at 20:00. The early bird catches the best seats.

What is the EinsteinSlam?

EinsteinSlam is the competitive art of making complex science accessible to a broad audience. There are just 10 minutes for every attendee to present his/her self-made performance. The event will finish with a public poll in order to evaluate if a particular contribution was either instructive and amusing or rather should have never been performed. The winner has the honour of taking the Golden Albert home. All presentations will be given in English. For more information please see **www.einsteinslam.de**.

Time: Monday 20:00–22:00 Location: Urania

EinsteinSlam

AKjDPG 3: PhD Symposium: Ultrafast spin-lattice interactions (joint session MA/AKjDPG)

The immensely fascinating field of magnetism research has branched into many lively communities such as spintronics, ultrafast demagnetization, all-optical switching, multiferroic materials, domain walls, magnetic textures and spin caloritronics just to mention a few. All of these hot research topics share that the relevant interacting magnetic moments are arranged within the framework of an atomic lattice which itself interacts with the spin system. The lattice thus does not only influence the geometrical arrangement of the magnetic moments but also serves as a major bath for energy, entropy and most importantly also angular momentum transfer within the studied systems. The symposium aims at exchanging ideas and at fostering the discussion about the effects of the spin- lattice interaction among various areas of magnetism research. We highly welcome contributions that explain basic mechanisms and results of the spin-lattice interaction from all communities. Spin-lattice interaction can be considered as one of the prototypical coupling mechanisms within correlated materials and the condensed matter research in general. It is a very timely topic as many applications in future information technology such as spintronic-devices, heat assisted magnetic recording, implementations of the Spin-Seebeck, all-optical magnetization switching greatly benefit from an understanding of this basic effect.

Organized by: Alexander von Reppert (U. Potsdam), Vivek Unikandanunni, (U. Stockholm), Kumar Neeraj, (U. Stockholm), Neha Jha (U. Greifswald), Tobias Wimmer, (Walther Meißner Institute München), Kamil Bobowski, (FU Berlin)

Time: Tuesday 9:30–13:15 Location: H 1012

Introduction by the organizers

Invited Talk AKjDPG 3.1 Tue 9:35 H 1012
Understanding spin and lattice interactions at ultrafast timescales — •Peter M. Oppeneer — Uppsala University, S-75120 Uppsala, Sweden

The interactions between spin moments and the crystal lattice are, in thermal equilibrium, responsible for a variety of phenomena, such as magnetostriction, magnetoelasticity, spin-reorientation transitions etc. In recent years these fundamental interactions are being probed on ultrafast timescales, which has led to discoveries of unexpected phenomena, as e.g. ultrafast demagnetization, breaking of exchange interactions, spin currents and all-optical switching. A characteristic feature of these discoveries is that an ultrashort excitation initiates highly correlated, out-of-equilibrium interactions of electrons, spins, and ions.

In this overview I survey the current understanding of ultrafast processes involving spins, phonons and hot electrons, aiming to go beyond a purely phenomenological picture and achieve atomistic theory. I shall address electron-phonon spin dissipation in the context of ultrafast laser-induced demagnetization, multiscale modeling of breaking of the exchange interaction, and helicity-induced all-optical switching. A second emerging area concerns ultrafast nonequilibrium energy flow between hot electrons and phonons; recent results emphasize that this flow proceeds in a manner different from the commonly used two-temperature model, and that therefore new theoretical modeling is required to capture the nonequilibrium electron-spin-lattice interplay.

5 minutes break

AKjDPG 3.2 Tue 10:25 H 1012
Magnetic and Structural Dynamics in Antiferromagnetically Coupled Fe/Cr Superlattices — •Daniel Schick[1,2], Daniel Bürgler[3], Niko Pontius[2], Stefan Eisebitt[1], and Christian Schüssler-Langeheine[2] — [1]Max-Born-Institut für Nichlineare Optik und Kurzzeitspektroskopie, Max-Born-Str.2a, Berlin, 12489, Germany — [2]Institut für Instrumentierung der Forschung mit Synchrotronstrahlung, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Albert-Einstein-Str. 15, Berlin, 12489, Germany — [3]Forschungszentrum Jülich GmbH, Wilhelm-Johnen-Straße 52428 Jülich, Germany

Employing the femtosecond soft X-ray pulses with variable polarization and photon energy delivered by the FemtoSpeX facility at the electron storage ring BESSY II we are able to probe the AFM (resonant magnetic diffraction), FM (XMCD), and structural (non-resonant diffraction) dynamics of Fe/Cr superlattices in one and the same pump-probe experiment. Hence, we can directly compare AFM vs. FM spin dynamics in the same material system by only applying a moderate magnetic field (< 100 mT). Moreover, we can probe the sub-ps structural dynamics due to coherent phonon excitation and its interaction with the spin system. The element selectivity of the resonant X-ray techniques further allows for differentiating the spin dynamics of the initially FM Fe and the non-magnetic Cr layers after photoexcitation and thus for probing possible transient magnetization in Cr due to ultrafast spin injection from the Fe layers.

Invited Talk AKjDPG 3.3 Tue 10:40 H 1012
Spin-Lattice coupling in ultrafast magnetization dynamics — •Bert Koopmans — Department of Applied Physics, and Institute for Photonic Integration (IPI),Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands

Novel schemes for controlling the ferromagnetic state at the femtosecond time scale by pulsed laser excitation have received great current interest recently. Driving systems into the strongly non-equilibrium regime, it has been shown possible not only to fully quench magnetic order, and but even to reverse the magnetic moment by a single pulse.

In this tutorial I will start with a historical review of the field of fs control of the magnetic state by pulsed laser excitation, introduce some of the time-resolved experimental techniques, and discuss the key questions that need to be answered. Next, I will explain the role of spin-lattice coupling in the process of ultrafast loss of magnetic order, including the local dissipation of angular momentum via Elliott-Yafet spin-flip scattering. Also the importance of laser-induced spin currents will be emphasized. Experimental results on a variety of systems and materials will be compared to predictions by the so-called microscopic three-temperature model. The importance of tuning both spin-flip scattering and spin currents for establishing all-optical switching (AOS) of the magnetization will be highlighted. Some of our most recent experiments on AOS by single fs pulses in synthetic ferromagnetic systems will be discussed.

15 minutes break

Invited Talk AKjDPG 3.4 Tue 11:25 H 1012
The role of spin-lattice interaction in optical control of magnetism — •Alexey Kimel — Radboud University, Nijmegen, The Netherlands

The action of electric field of light on electronic dipoles, being the largest perturbation in physics of light-matter interaction, conserves the spin of electron. This is why experiments showing the possibility of ultrafast and efficient control of spins with the help of femtosecond laser pulses are among the most heavily debated topics in magnetism. In my talk I will review the progress in understanding of ultrafast laser-induced magnetization dynamics. In particular, I would like to discuss the roles of the spin-lattice interaction in heat-driven, heat-assisted, and heat-free mechanisms of optical control of magnetic order.

AKjDPG 3.5 Tue 11:55 H 1012

Structural dynamics during laser-induced ultrafast demagnetization — •Emmanuelle Jal[1], Victor Lopez-Flores[2,3], Niko Pontius[4], Tom Ferte[5], Christine Boeglin[5], Boris Vodungbo[1], Jan Lüning[1,2], and Nicolas Jaouen[2] — [1]Sorbonne Universités, UPMC Univ. Paris 06, CNRS, LCPMR, 75005 Paris, FRANCE — [2]Synchrotron SOLEIL, Saint-Aubin, Boite Postale 48, 91192 Gif-sur-Yvette Cedex, FRANCE — [3]CSIC - University of Seville, Av. Americo Vespucio, 49, 41092 Seville, SPAIN — [4]HZB für Materialien und Energie GmbH, Albert-Einstein-Straße 15, 12489 Berlin, GERMANY — [5]Université de Strasbourg, CNRS, IPCMS, UMR 7504, F-67000 Strasbourg, FRANCE

I will present our investigation of the infrared laser-pulse-induced ultrafast demagnetization process in a thin Ni film, which characterizes simultaneously magnetization and structural dynamics [PRB 95 184422]. This is achieved by employing femtosecond timeresolved x-ray resonant magnetic reflectivity (tr-XRMR) as the probe technique. The experimental results reveal unambiguously that the subpicosecond magnetization quenching is accompanied by strong changes in nonmagnetic x-ray reflectivity. These changes vary with reflection angle, and changes up to 30% have been observed. By modeling the x-ray reflectivity of the investigated thin film, we can reproduce these changes by a variation of the apparent Ni layer thickness of up to 1%. Extending these simulations to larger incidence angles, we show that tr-XRMR can be employed to discriminate experimentally between currently discussed models describing the ultrafast demagnetization phenomenon.

5 minutes break

Invited Talk AKjDPG 3.6 Tue 12:15 H 1012

Driving magnetization precession by dynamical compressive and shear strain in a low-symmetry metallic film — •Alexandra M. Kalashnikova[1], Tetiana L. Linnik[2], Vladimir N. Kats[1], Jasmin Jaeger[3], Alexey S. Salasyuk[1], Dmitri R. Yakovlev[3], Andrew W. Rushforth[4], Andrey V. Akimov[4], Manfred Bayer[3], and Alexey V. Scherbakov[1,3] — [1]Ioffe Institute, St. Petersburg, Russia — [2]Department of Theoretical Physics, V. E. Lashkaryov Institute of Semiconductor Physics, Kyiv, Ukraine — [3]Experimentelle Physik 2, Technische Universität Dortmund, Dortmund, Germany — [4]School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom

We report on manipulating magnetocrystalline anisotropy via inverse magnetostriction on a picosecond time scale in a low-symmetry film of a magnetic metallic alloy galfenol (Fe,Ga). Two approaches are emploied, injection of a picosecond strain pulse into the film, and generation of a dynamical strain of a complex temporal profile in the film directly. In both cases the ultrafast change of magnetic anisotropy triggers magnetization precession owing to the mixed, compressive and shear, character of the dynamical strain emerging in the low-symmetry metallic film.

When optically-generated strain emerges abruptly in the film and modifies its magnetic anisotropy, it competes with heat-induced change of anisotropy. We show that optically-generated strain remains efficient for launching magnetization precession, when the heat-induced changes of anisotropy parameters do not trigger the precession any more.

Invited Talk AKjDPG 3.7 Tue 12:45 H 1012

Ultrafast Thermal Transport in Magnetic Heterostructures — •Richard Wilson[1], Michael Gomez[1], Jon Gorchon[2], Yang Yang[2], Charles-Henri Lambert[2], Sayeef Salahuddin[2], and Jeff Bokor[2] — [1]Materials Science and Engineering, University of California Riverside, Riverside, United States — [2]Electrical Engineering and Computer Sciences, University of California Berkeley, Berkeley, United States

Femtosecond heating of magnetic materials leads to a wide array of extraordinary thermally driven magnetic phenomena. Understanding and controlling ultrafast magnetic phenomena requires a detailed understanding of thermal transport in complex magnetic heterostructures. To achieve this understanding, we use a combination of TDTR and TRMOKE experiments to quantify thermal transport in magnetic heterostructures. We use ultrafast electrical or optical stimulus drive the heterostructures from thermal equilibrium. Then, we monitor tiny changes in optical and magneto-optic properties to monitor changes in temperature and magnetism. We interpret our data with spin and thermal transport models that quantify the diffusion of heat and spin across layers, as wells as energy flow between electronic-, vibrational-, and magnetic-degrees-of-freedom. Here, I discuss our recent efforts to understand ultrafast thermal phenomena in ferrimagnetic heterostructures. These experiments focus on both normal-metal/ferrimagnetic-metal heterostructures, e.g. Au/GdFeCo or Pt/GdFeCo, and normal-metal/ferrimagnetic-insulator heterostructures, e.g. Au/TmIG or Au/YIG.

AKjDPG 4: Physics for everyone - Outreach activities for young researchers

Science dissemination plays a fundamental role in a scientist's life, and it is crucial for everyone involved in academia to raise awareness of the usefulness of science and fundamental scientific research in everyday life. In this session, after a short introduction on the role of outreach projects in a researchers career, we wish to give an overview on successful outreach projects in Europe and beyond, such as EPS Young Minds Project, DPG Physics for Refugees and Sunshine for Palestine. The second part of this session will be in the form of a workshop, where the participants will be divided in groups and assigned a case study to discuss, regarding the planning of an outreach activity for a specific audience.

Organised by: Roberta Caruso (EPS Young Minds), Ulrike Ritzmann (EPS Young Minds), Araceli Venegas-Gomez (EPS Young Minds)

Time: Wednesday 9:30–12:40 Location: E 124

AKjDPG 4.1 Wed 9:30 E 124

Importance of Outreach for Scientists — •Rüdiger Voss — EPS President

In this talk, I will discuss the relevance of outreach and education activities for scientists at all career stages. It is important to raise awareness of the strong impact of scientific results on every-day life. Here, I will review outreach activities of the European Physical Society and discuss the benefits of outreach activities especially for early-stage researchers.

AKjDPG 4.2 Wed 9:55 E 124

EPS Young Minds Project — •Roberta Caruso — EPS Yound Minds

Young Minds is an EPS project started in 2010 to encourage graduate and undergratuate students to get together to form self-organized groups called Sections, in order to carry on a number of activities ranging from outreach to professional development. In these seven years the project has seen a continuous growth, and nowadays it counts more than 40 sections all over Europe, organizing more and more ambitious activities.

AKjDPG 4.3 Wed 10:15 E 124

Physics for All - A project to carry physics into refugee sites — •Sarah Schulz — DPG office

Physics for All is a project of the German Physical Society (DPG) and the Georg-August University Göttingen, funded by the German Federal Ministry of Education and Research (BMBF). The project is based on the idea that the phenomena of nature are universal. Playing with nature, doing physical experiments is a deep human need, which does not require any language skills and is independent of any

national, religious, age or gender boundaries. By performing simple experiments we bring physics to children and young people in refugee sites nationwide in a playful way. With the help of many volunteers we are able to put the project into practice at more than 75 sites and schools nationwide. All experimental equipment is centrally organized and sent to our voluntary helpers on site. Link to the project: https://www.dpg-physik.de/pff

AKjDPG 4.4 Wed 10:35 E 124

The Science4People Project, Scientific Dissemination in Palestine — •Barbara Capone — Department of Science, Università di Roma Tre, Italy

The Science4People project aims at empowering a group of young women in science in Palestine, who already set up an alternative education program in local schools. A team of young female students from Bethlehem University, supported by the group of scientists of Sunshine4Palestine, an NGO founded by physicists and engineers, set up a series of simple experiments that can be performed with everyday life material, on the themes of energy and water.

Kids living in critical conditions, often without access to electricity and water,are involved un the scientific dissemination project by being exposed to science through a ludic approach, thus learning how to manufacture a small battery with scrap material, how to build their own little lamp, but especially how science can be a path to undertake and solve everyday problems.

Starting from March 2017, the group of girls started its path going in different local public and private schools in Bethlehem from the most diversified social background, involving over 400 students aged 6 to 18.

As a joined effort between the European Physical Society, Sunshine4Palestine and ICTP the beginning of April will see 4 amongst the Science4People girs travel to the International Center for Theoretical Physics in Trieste where they will get a full FABLAB training by learning how to how to mount, use and program 3D printer that will then be installed at the University of Bethlehem .

15 min. break

AKjDPG 4.5 Wed 11:10 E 124

Workshop: How to organize an outreach event? — •Ulrike Ritzmann, Roberta Caruso, and Araceli Venegas-Gomez — EPS Yound Minds

How can you present your research field to high school students and encourage them to study physics? Which experiments can you perform in kindergarten to share your fascination of physics with them? In this workshop, we want to discuss in small groups different practical aspects of organising outreach events.

AKjDPG 5: Industry Day: One Idea Ahead (joint session AKjDPG/AKC/AIW)

The intension of the Industry Day is to give a broad overview about how innovative physics plays a role in small companies and start-ups. Four economic professionals will demonstrate how they apply physics in business. They will present their enterprises and talk about their ideas which led to the founding process. The focus lies on small and medium-sized companies and ranges from technically oriented start-ups to engineering consulting firms. In an ensuing panel discussion different ways and possibilities for enterprise foundation will be discussed and the attendees are invited to ask questions. Finally, there will be a cozy gathering with "Bier and Brez'n" for more discussion, questions as well as for networking and socializing.

Organised by: Karl-Philipp Strunk (AIW), Susanne Kränkl (AKC), Matthias Dahlmanns (jDPG)

Time: Wednesday 15:00–19:00 Location: E 020

Invited Talk AKjDPG 5.1 Wed 15:00 E 020

Becoming Business Owner - an Example — •Volker Türck — Berlin

Founding your own company and becoming independent is an idea that seems to inspire more and more people. But how exactly do you do that? What qualifies a physicist to start a business? How do you get the decisive idea? To what extent do you need to be an economist? These are questions that I hear quite often. In this talk I will describe my way from science to business and take a look at the aspects of planning and strategy but also at the moments where luck and chance played an important part. I will also explain what kind of service my company provides and what customers we work with

Invited Talk AKjDPG 5.2 Wed 15:30 E 020

Cameras for the physical experiments of tomorrow — •Roman Kemmler — greateyes Gmbh, Berlin, Germany

Imaging and spectroscopy are widely used methods to reveal both known and unknown phenomena in physics, chemistry, biology, material science, forensic, and other subjects. Applications in science and industry are manifold. Any detector as part of an optical system (microscope, spectroscope, *)plays a crucial role for the quality and significance of the measurement result. Improvements on its resolution, quantum efficiency, system noise, or vacuum compatibility can have a great impact.

greateyes - a spin-off from Humboldt University of Berlin - develops, manufactures, and markets scientific high-performance cameras for low light applications from the X-ray to the NIR region with a focus on the non-visible range. The talk intends to give a brief insight in the physical, electrical and even mechanical challenges when optimising detectors for cutting-edge physical experiments. The company's SuperResolution product innovation is given as an example. Furthermore high-repetition-rate spectroscopy and photoluminescence imaging of as-cut wafers are being discussed.

Founded in 2008, greateyes quickly developed into an international acting company. Today it has strong customers in research and industry all around the globe.

15 min. coffee break

Invited Talk AKjDPG 5.3 Wed 16:15 E 020

From physics to adtech — •Markus Düttmann — DCMN GmbH, Boxhagener Str. 18, 10245 Berlin

Starting from the simple idea that decision making works better if it's algorithm-based, the three physicists Heiko Schmidle, Christian Graf and Markus Düttmann ventured into the Berlin tech scene. They founded the company realzeit, a Berlin-based adtech startup. A programmatic DSP, realzeit is a real-time bidding platform built on complex algorithms for targeting potential customers, optimising budgets, and clustering ad inventory and users.

The company has since been acquired by the growth marketing company DCMN, where the three physicists continue to work on building great technology products. Markus will give some insights into his career path after university and will provide a glimpse into Berlin's startup scene.

Invited Talk AKjDPG 5.4 Wed 16:45 E 020

Medical applications of high power laser diodes — •Tilmann Trebst — LifePhotonic GmbH

In the last decades lasers have become reliable tools in the daily clinical routine. The still progressing development of new laser diodes with a multitude of wavelengths and increasing power supports this trend and opens up new applications. A few examples of successful laser treatments will be presented while discussing options and requirements for lasers and fiber based applications systems.

Discussion AKjDPG 5.5 Wed 17:15 E 020

Discussion — •Karl-Philipp Strunk — DPG, Working Group on Industry and Business (AIW)

During the previous talks, different ways and possibilities for enterprise foundation where presented. Now it's time to discuss and to give the opportunity for asking questions about this wide topic to the four speakers.

At the end of the industry day everyone is invited to a more informal get-together with Bier and Brez'n.

AKjDPG 6: Careers in Physics: inside Academia

After your Phd, there are several ways to continue your academic career. We would like to introduce you to career opportunities as a researcher in Europe. The event will take the form of a discussion panel, and invited speakers from early Post-docs to senior researchers will share their experience. Young physicists – master students, graduate students, and post-docs – will have the chance to engage with different speakers through a questions and answers session.

Organised by: Roberta Caruso (EPS Young Minds), Ulrike Ritzmann (EPS Young Minds), Araceli Venegas-Gomez (EPS Young Minds)

Time: Thursday 9:30–11:00 Location: E 020

AKjDPG 6.1 Thu 9:30 E 020

Career in Academia — •Aline Dinkelaker[1], Jean-Jaques Greffet[2], Antigone Marino[3], Fatema Tanjia[4], and Andy Thomas[5] — [1]Institut für Physik, Humboldt-Universität zu Berlin, Germany — [2]Institut d'Optique Graduate School, Palaiseau, France — [3]Institute of Applied Sciences and Intelligent Systems, Physics Department, University of Naples Federico II, Italy — [4]Centre National de la Recherche Scientifique (CNRS), Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS), France — [5]Leibniz Institut for Solid State and Materials Research, Dresden, Germany

Fatema Tanjia

Fatema Tanjia is from Dhaka, Bangladesh. After completion of Master degree from Bangladesh, she moved to Naples, Italy in 2010 to do her PhD in Università di Napoli "Federico II". After PhD, she continued to work there as a postdoctoral researcher until April 2016. During PhD and first postdoc, she worked on the development of the theory of plasma based acceleration mechanisms. After that she moved to Strasbourg, France with a Marie Skłodowska-Curie (MSC) Individual Fellowship funded by European Commission. Currently she is working there in quantum mechanical phenomena of different nano particles and their optical properties. She was one of the first women from her country to receive the MSC Individual fellowship. From the perspective of being a foreign student in Europe, she would like to share her personal experience in building career in Physics as a young researcher.

Aline Dinkelaker

Aline Dinkelaker is a postdoctoral researcher in the Quantum Sensors and Ultracold Atoms team within the Optical Metrology group at Humboldt-Universität zu Berlin. Aline studied Physics at the Technische Universität Berlin and graduated in 2010 after writing her thesis on solar flares at the University of Glasgow, Scotland. In 2013, she received her PhD from the University of Strathclyde on the topic of magnetic ring traps for cold atoms. Her current research at Humboldt-Universität zu Berlin is supported by the German Aerospace Agency (DLR) and focuses on laser systems for atomic physics experiments on microgravity platforms and in space: at the ZARM drop tower, on research rockets, and for small satellites. She is involved on different levels, from project management and payload design over laser integration, system assembly and testing to experimental control (e.g.KALEXUS during the TEXUS-53 research rocket flight).

Antigone Marino

Antigone Marino is researcher at the Institute of Applied Sciences and Intelligent Systems (ISASI) of the Italian National Research Council (CNR). She received her master in Physics in 2000, and the research doctorate in New Technologies in 2004, both at the Physical Science Department of Federico II University of Naples, in Italy. Her research activities have been concentrated on the study of soft matter optics applied to telecommunication, with a special interest in liquid crystals technologies. She received several awards and recognitions. In 2015 she won the Outstanding Young Professionals Award of the Optical Society (OSA). In 2016 she has been awarded OSA Ambassador. In 2017 she won the Achievement Award by the European Physical Society.

Andy Thomas

Andy Thomas studied physics at Bielefeld University. After a two year fellowship at the Massachusetts Institute of Technology he returned to Bielefeld to work as a senior researcher. In October 2009, he received an independent researcher grant from the NRW state government and he worked as a visiting professor at Mainz, Osnabrück and Hamburg universities. Since July 2015 he leads the Quantum Materials and Devices Group at the Leibniz Institute for Solid State and Materials Research in Dresden. The scientific focus of his group is layered materials, topological insulators, correlated oxides and their use in suitable devices.

Jean-Jacques Greffet

Jean-Jacques Greffet obtained a PhD from university Paris-Sud Orsay in 1988 in solid state physics and the Habilitation in 1992. He was a professor at Ecole Centrale Paris. He is currently professor at Institut d'Optique, and a senior member of Institut Universitaire de France. His current research interests include nanophotonics (nanoantennas, quantum plasmonics) and the design of smart IR incandescent sources. Jean-Jacques Greffet is the head of the Doctoral School Waves and Matter at Université Paris-Saclay.

AKjDPG 7: Careers in Physics: outside Academia

It is well know that a large percentage of Physics PhD students goes on to, ultimately, occupy an non-academic position. EPS Young Minds wishes to discuss and promote career paths and opportunities of young European Physicists, organising a career event on professional paths beyond Academia.

In the form of a discussion panel, young physicists - master students, graduate students, and post-docs - will have the chance to engage with different speakers through a questions and answers session.

This event offers a diverse view on professional profiles, such as editing and publishing, innovation and creation of a start-up, as well as data science and innovation.

Organised by: Roberta Caruso (EPS Young Minds), Ulrike Ritzmann (EPS Young Minds), Araceli Venegas-Gomez (EPS Young Minds)

Time: Thursday 11:15–12:45 Location: E 020

AKjDPG 7.1 Thu 11:15 E 020

Career outside Academia — •Mathieu Grisolia[1], Lucia Santa Maria[2], Luis Prill Sempere[3], and Benjamin Sheard[4] — [1]Quattrocento, Paris, France — [2]Amazon, Berlin, Germany — [3]TravelXite, Leipzig, Germany — [4]IOP Publishing, Institute of Physics, Bristol , UK

Spin-Off — Mathieu Grisolia

Mathieu Grisolia is a Project manager and technology - business analyst at the Quattrocento incubator in Paris France. He graduated in Physics and Mathematics at the Ecole Polytechnique in Palaiseau, and went on to do a double Masters in Condensed Matter Physics at the Ecole Normale Supérieure in Paris and at the Ecole polytechnique. He received his Ph.D. in 2016 from Paris-Saclay University, for graduate work done in the Unité Mixte de Recherche CNRS - Thales, on the emergence of novel behaviour at oxide interfaces. His competences include radio frequency physics, multiferroics, spintronics (TMR, GMR, AMR, ...) and the electronic properties of correlated oxides. Mathieu Grisolia held an Undergraduate Research Assistant position at Columbia University in 2011, and was a Research and Development and Innovation consultant at Areva from 2013 to 2015. He is the laureate of the 2016 gold medal of the Materials Research Society, awarded during the 2016 MRS Spring Meeting.

Data Scientist — Lucia Santamaria

Lucía is a data scientist with background in computational astrophysics, currently working as a machine learning engineer on machine translation at Amazon in Berlin. She's also involved in a project to analyze trends in academic publishing in STEM fields. In the past she's held other data science roles focused on recommender systems, bibliometrics, and named-entity disambiguation, both in the private and public sectors. Previously, she did doctoral and postdoctoral research at the Max Planck Institute for gravitational physics (Albert Einstein Institute) and Caltech. Her academic work concentrated on the theoretical and numerical modeling of binary black hole sources for the LIGO gravitational-wave detectors, back in the pre-detection era.

Product Management and Innovation — Luis Prill Sempere

Luis works as Chief Product Officer for TravelXite, a start-up from Mallorca, focusing on adapting Salesforce to the needs of rental agencies of luxury homes. Think AirBnB for professionals. Currently TravelXite is promoting its ICO to create a new foundation with the mission to standardize and modernize the tourism market with the help of the blockchain. His studies of physics started in Würzburg and ended at the UT at Austin with some collaboration with Caltech. In parallel Luis was always interested in web development projects. After his PhD on surface plasmon polaritons on gold and silver filled photonic crystal fibres at the Max Planck Society in Erlangen, he tried his luck in the start-up field. Later he worked as an analyst for IT architecture at Senacor and CEO assistant / innovation analyst at ARRI. Until today his private focus remains on finding general solutions to real world problems.

Publishing — Benjamin Sheard

Ben has worked at IOP Publishing, UK for 6 years: first as Editor of a number of journals, and recently as Publisher of New Journal of Physics and Journal of Physics Communications. As Editor, he managed the day-to-day peer review process: assessing the suitability of manuscripts, and making publication decisions based on referee and Editorial Board member reports. As Publisher, he manages the overall strategic direction of his journals, working closely with external Editorial Boards to maintain the general quality and standing of the journals. A large part of this role involves topical commissioning of articles and attending conferences to build contacts and track research trends. Before joining IOP Publishing, Ben completed a PhD in experimental ultracold atom physics at the University of Oxford, and an undergraduate physics degree at Imperial College, London.