IAP Seminar

Christopher Albert

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Tuesday, 27th June 2023, 16:00 s.t.
TU Wien, Institut für Angewandte Physik, E134
1040 Wien, Wiedner Hauptstraße 8-10
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B

Magnetic confinement fusion in optimized stellarators

Fusion power plants would be a welcome component in a sustainable energy system. After decades of research and development, several key questions remain: Where do we stand? What are the open problems in physics and technology? How can the remaining research and development towards a fusion reactor with high energy gain be accelerated in a cost-effective manner? In this presentation, some basics will be outlined first to understand the required parameters of a fusion reactor and the historical development of device size and performance. Then we will focus on the stellarator concept for magnetically confining fusion plasmas using complex 3D electromagnetic coils. Recent breakthroughs in both, theory and experiment have demonstrated that it is possible to produce highly optimized geometries in simulation, and construct a high-performance machine within the required tolerances. After presenting novel energetic ion confinement optimizer metrics, we will conclude with a presentation of a recent joint initiative of TU Graz and TU Wien: Rapid prototyping of inexpensive tabletop stellarators that use electrons as a scale-model for ions.

Christopher Albert is a theoretical plasma physicists with research interests in numerical simulations of non-axisymmetric effects in magnetic confinement fusion, Hamiltonian systems, and physics-consistent regression methods. After a PhD at TU Graz and a PostDoc at Max-Planck-Institute for Plasma Physics in Germany, he holds a tenure-track assistant professorship and heads the plasma physics group at TU Graz.

All interested colleagues are welcome to this seminar lecture
(45 min. presentation followed by discussion).

Friedrich Aumayr
(LVA-Leiter)

Richard Wilhelm
(Seminar Chair)