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Press release

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European Research Council supports four projects at TU Darmstadt with ERC Starting Grants

This success is impressive: four young researchers at TU Darmstadt have been awarded a Starting Grant by the European Research Council (ERC) for excellent and innovative fundamental and frontier research. The selected early career researchers will be receiving a total of around 1.5 million euros each for their projects on learning robot systems, digital 3D doppelgangers, permanent magnets and deformed atomic nuclei over a period of five years. This excellent achievement once again shows TU Darmstadt's research prowess – including by international standards.

In the current funding round, the ERC has selected four projects by researchers at TU Darmstadt: "SIREN" by Professor Georgia Chalvatzaki (Department of Computer Science), "Learning Digital Humans in Motion" by Professor Justus Thies (also the Department of Computer Science), "MAG-TOOL" by Dr. Pelin Tozman (Department of Materials and Geosciences) and "DeformedNuclei" by Dr. Alexander Tichai (Department of Physics).

"My heartfelt congratulations to Georgia Chalvatzaki, Justus Thies, Alexander Tichai and Pelin Tozmann on being awarded an ERC Starting Grant," said TU President Professor Tanja Brühl. "It is a wonderful and truly remarkable success that four colleagues of our university are receiving this award in the current round and will now start working on their highly innovative projects. At TU Darmstadt, we cooperatively develop future-oriented solutions for the challenges of today and those yet over the horizon. Our university as a place of strong collaborative research thrives on the individual excellence of our scientists."

The European Union uses the Starting Grant to promote outstanding research and, at the same time, early career researchers. The Starting Grant is aimed at researchers who can already demonstrate excellent work and now want to expand their own research or set up their own research group at the start of their careers. In the current round, 494 grants were awarded and 3,474 applications were submitted.

Project "SIREN"
As part of the "SIREN" ("Structured Interactive Perception and Learning for Holistic Robotic Embodied Intelligence") project, computer science professor Georgia Chalvatzaki is dedicated to developing "robotic embodied intelligence". She researches methods for enabling robots understand their capabilities to take on complex tasks in unstructured environments. "SIREN" investigates the principles and structures that lead to the development of intelligence focusing on the continuous interaction of robots with their environment. The aim is a holistic view in which robots and the environment are seen as one unified system. The results of "SIREN" could be groundbreaking for future adaptive robot systems.

Project "Learning Digital Humans in Motion"
In his project "Learning Digital Humans in Motion", Professor Justus Thies concerns himself with the development of AI-based image processing and graphic tools that enable lifelike digital representations of people for the immersive

digital world. These digital 3D doppelgangers can be used for applications in virtual and augmented reality, such as immersive telepresence, virtual mirrors in e-commerce and computer games. Thies's team researches how people move, develops motion synthesis methods and investigates the question of whether natural language can be used to depict digital humans. The aim is a high-quality reproduction of appearance and movement.

Project "MAG-TOOL"
In the MAG-TOOL project, material scientist Dr. Pelin Tozman is researching resource-friendly, safe and affordable permanent magnets. She is investigating alternative components to heavy rare earths, which have been used to date, but whose mining is problematic for the environment. Tozman combines innovative material processing with machine learning, making her research project unique. Permanent magnets are crucially important for green technologies and are used, among other things, in electric vehicles and wind turbines.

Project „DeformedNuclei"
Nuclear physics is a pillar for our current understanding of the universe. The description of atomic nuclei and nuclear matter connects microscopic systems with macroscopic objects in astrophysics. A precise understanding of the diversity of nuclear phenomena and their emergence from the interaction between neutrons and protons affects many areas of modern physics. Despite tremendous advances in recent years, nuclear physicists are still lacking a fully controlled understanding of the nuclei across the nuclear chart.
With his research project, "DeformedNuclei – Ab initio pathway to deformed nuclei", Alexander Tichai from the Institute for Nuclear Physics at TU Darmstadt is aiming to change this. He is developing new methods for investigating deformed nuclei and analysing the effects of interaction models on the predicted nuclear properties.

About TU Darmstadt
TU Darmstadt is one of the leading technical universities in Germany and a synonym for excellent, relevant research. TU Darmstadt is playing a decisive role in shaping global transformations – from the energy transition and Industry 4.0 through to artificial intelligence – with outstanding insights and forward-looking study opportunities.
TU Darmstadt pools its cutting-edge research in three fields: Energy and Environment, Information and Intelligence, and Matter and Materials. Its problem-based interdisciplinarity and productive interaction with society, business and politics generate progress towards sustainable development worldwide.
Since it was founded in 1877, TU Darmstadt has been one of Germany's most international universities and, as a European technical university, it is developing a trans-European campus in the Unite! alliance. In cooperation with its partners in the Rhine-Main Universities – Goethe University Frankfurt am Main and Johannes Gutenberg University Mainz – it is continuing to develop the Frankfurt Rhine-Main metropolitan region as a globally attractive science location.
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