

## Program

### Tuesday, 6 December 2022

09:00–09:15	Introduction and Welcome <b>Christian Hasse (TU Darmstadt)</b>
09:15–10:45	Hydrogen production in a renewable energy context <b>Jan Philipp Hofmann (TU Darmstadt)</b>
10:45–11:15	Coffee break
11:15–12:45	Photoelectrochemical routes to solar fuels <b>Roel van de Krol (Helmholtz Zentrum Berlin)</b>
12:45–14:00	Lunch
14:00–15:30	Low temperature fuel cells – from fundamentals to applications <b>Viktor Hacker (TU Graz, CEET)</b>
15:30–16:00	Coffee Break
16:00–17:30	Combustion of metal fuels: From fundamental research to practical application (online only) <b>Jeroen van Oijen (TU Eindhoven)</b>
17:30–21:00	Poster sessions and walking dinner Dinner will be served 18:30 in the foyer of the lecture hall

### Wednesday, 07 December 2022

08:30–10:00	Chemical concepts towards sustainable catalysts within the Collaborative Research Center 1487 Iron, upgraded! <b>Ulrike Kramm, Vera Krewald (TU Darmstadt)</b>
10:00–10:30	Coffee break
10:30–12:00	Fe-N-C catalysts: Sustainable catalysts for fuel cell applications <b>Stefania Specchia (Politecnico di Torino)</b>
12:00–14:00	Lunch
14:00–15:30	Catalyst development for alkaline fuel cells <b>Tanja Kallio (Aalto University)</b>
15:30–16:00	Coffee Break
16:00–17:30	Hydrogen policy in multi-level governance <b>Michèle Knodt (TU Darmstadt)</b>
18:00	Dinner

### Thursday, 08 December 2022

08:30–10:30	Lab Tour (Campus Lichtwiese)
10:45–11:00	Coffee break
11:00–12:30	Global opportunities and challenges for iron as a recyclable energy carrier <b>Christian Hasse, Andreas Dreizler (TU Darmstadt)</b>
12:30–14:00	Lunch
14:00–15:30	System challenges for defossilizing the industrial sector (online only) <b>Andrea Ramírez (TU Delft)</b>
15:30–15:45	Closing remarks

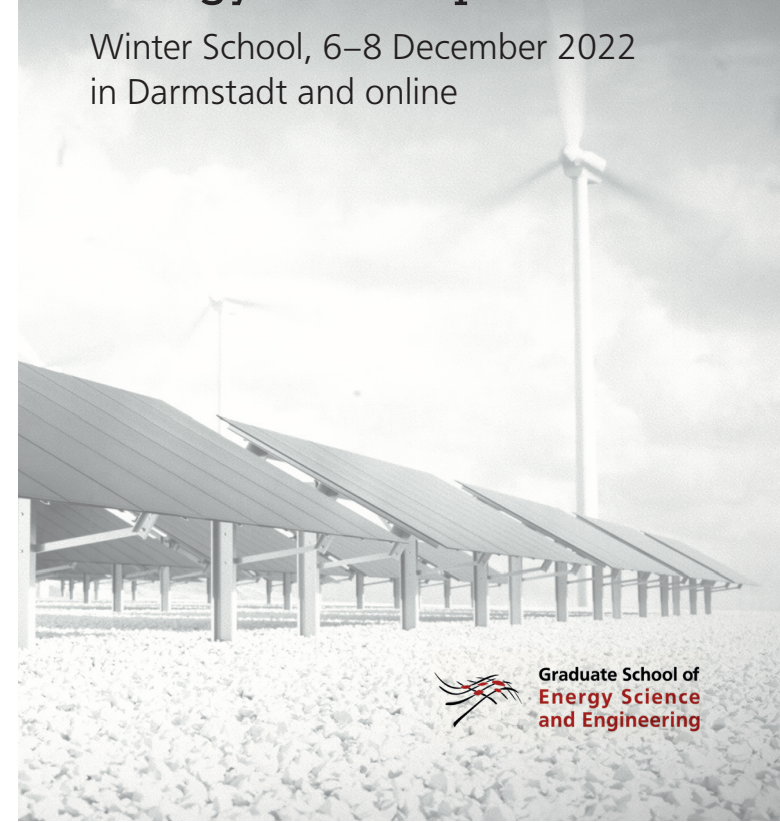
The Winter School 2022 is organised and supported by



Further information and registration:  
<https://www.energy.tu-darmstadt.de/ws>

## Sustainable and Resilient Energy for Europe?!

Winter School, 6–8 December 2022  
in Darmstadt and online



## ***Sustainable and Resilient Energy for Europe?!***

The Graduate School Energy Science and Engineering is glad to invite you to join the international winter school from 6–8 December 2022 in Darmstadt. The event will explore scientific and technical aspects of the production and use of carbon-free and sustainable energy storage systems such as hydrogen and iron, as well as the socio-economic aspects such as multi-level governance of hydrogen strategies. Participants will thus gain a unique insight into current challenges and solution approaches in an energy landscape that is changing daily.

### ***Scope***

The transformation of energy systems is one of the most pressing challenges of our time. While climate neutrality and the reduction of fossil CO<sub>2</sub> emissions were in the foreground in the past years, security of supply has become a high priority since the Russian war against Ukraine. However, a sustainable and resilient energy supply also means moving away from fossil fuels. To increasingly replace them with wind and solar, chemical energy carriers such as hydrogen are key for storing, transporting and using renewable energy. As another complementary option to hydrogen, metals such as iron have come more into the focus of science and industry as carbon-free energy storage. Whatever the technical solution, it must not be evaluated separately, but always in combination with the socio-economic aspects.

### ***Who should attend***

The Winter School „Sustainable and Resilient Energy for Europe?!“ is directed towards doctoral candidates and postdocs performing research on energy systems, energy policy or the energy economy, as well as practicing engineers and researchers involved in R&D of energy systems.

### ***Registration and venue***

The Winter School Energy Science and Engineering 2022 will take place in Darmstadt from 6–8 December 2022. Participation is possible both in attendance and online. Please register online at:

<https://www.energy.tu-darmstadt.de/ws>

Lecture hall:  
Technical University of Darmstadt  
Campus Stadtmitte (city centre)  
Hochschulstraße 1, building S1|03 Room 283  
64289 Darmstadt, Germany

## ***Speakers and talks***



**Jan Philipp Hofmann,**  
*TU Darmstadt, Surface Science*

Hydrogen production in a renewable energy context



**Roel van de Krol**  
*Helmholtz Zentrum Berlin, Solar Fuels*

Photoelectrochemical routes to solar fuels



**Viktor Hacker**  
*TU Graz, CEET*

Low temperature fuel cells – from fundamentals to applications



**Jeroen van Oijen**  
*TU Eindhoven, EIRES*

Combustion of metal fuels: From fundamental research to practical application (online only)



**Ulrike Kramm & Vera Krewald**  
*TU Darmstadt, Chemistry*

Chemical concepts towards sustainable catalysts within the Collaborative Research Center 1487 Iron, upgraded!



**Stefania Specchia,**  
*Politecnico di Torino, DiSAT*

Fe-N-C catalysts: Sustainable catalysts for fuel cell applications



**Tanja Kallio**  
*Aalto University*

Catalyst development for alkaline fuel cells



**Michèle Knodt**  
*TU Darmstadt, Political Science*

Hydrogen policy in multi-level governance



**Andreas Dreizler & Christian Hasse**  
*TU Darmstadt, Mechanical Engineering*

Global opportunities and challenges for iron as a recyclable energy carrier



**Andrea Ramírez Ramírez**  
*TU Delft, Engineering Systems and Services*

System challenges for defossilizing the industrial sector (online only)