

## Press Release

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# Dr. Yan Ma receives Walter Benjamin Grant of the German Research Foundation

Material scientist at the Max-Planck-Institut für Eisenforschung will focus on green steel production

The German Research Foundation awards Dr.-Ing. Yan Ma, new head of the group “Sustainable Synthesis of Materials” at the Max-Planck-Institut für Eisenforschung (MPIE) the Walter Benjamin Grant. This grant enables Ma to conduct his own research project on green steel production.

### **Iron ore reduction with hydrogen**

Steel production accounts for ca. 7% of the global total CO<sub>2</sub> emissions. The reduction of iron ore in the usual blast furnaces makes up about 80-90% of these emissions. Ma’s project will tackle these challenges. “I’m happy and honoured to receive this prestigious award. My project focusses on the reduction of iron ore with hydrogen. This approach is already tested industrially. However, an overall use of hydrogen instead of carbon to reduce iron ore is still limited by the unknown kinetics of the reduction process. I will analyse the relation between the micro- and nanostructures and the reduction kinetics to understand the role of material defects in the reduction process”, says Ma. The microstructure characterization will take place in operando, that means during the reduction process, and consider both, the structure and chemistry of the iron ore. The results of this project will help to overcome the current kinetic limitations thus allowing the reduction near the thermodynamic and kinetic boundary conditions.

### **Working independently with the Walter Benjamin Programme**

The Walter Benjamin Programme enables postdoctoral researchers at an early career phase who are associated with a German research institution or work there, to conduct independently a research project of their choice. The award finances the group heads position for two years while the host institution covers additional project needs. The prize is named after Walter Benjamin, a German philosopher and cultural critic, who lived from 1892-1940.



Dr. Yan Ma, head of the group “Sustainable Synthesis of Materials” at the Max-Planck-Institut für Eisenforschung, received the Walter Benjamin Grant of the German Research Foundation.  
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The international team of the Max-Planck-Institut für Eisenforschung conducts advanced basic materials research for the fields of mobility, energy, infrastructure, medicine and digitalisation. The focus lies on nanostructured metallic materials as well as semiconductors, which are analysed down to their atomic and electronic scales. This enables the MPIE team to develop new, tailor-made structural and functional materials embracing their synthesis and processing, characterization and properties, as well as their response in engineering components exposed to real operating environments.

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