Pushing Towards Room-Temperature Superconductivity

Shirin Mozaffari

PI: Dr. Luis Balicas

National High Magnetic Field Laboratory

MAX-PLANCK-INSTITUT FÜR CHEMIE

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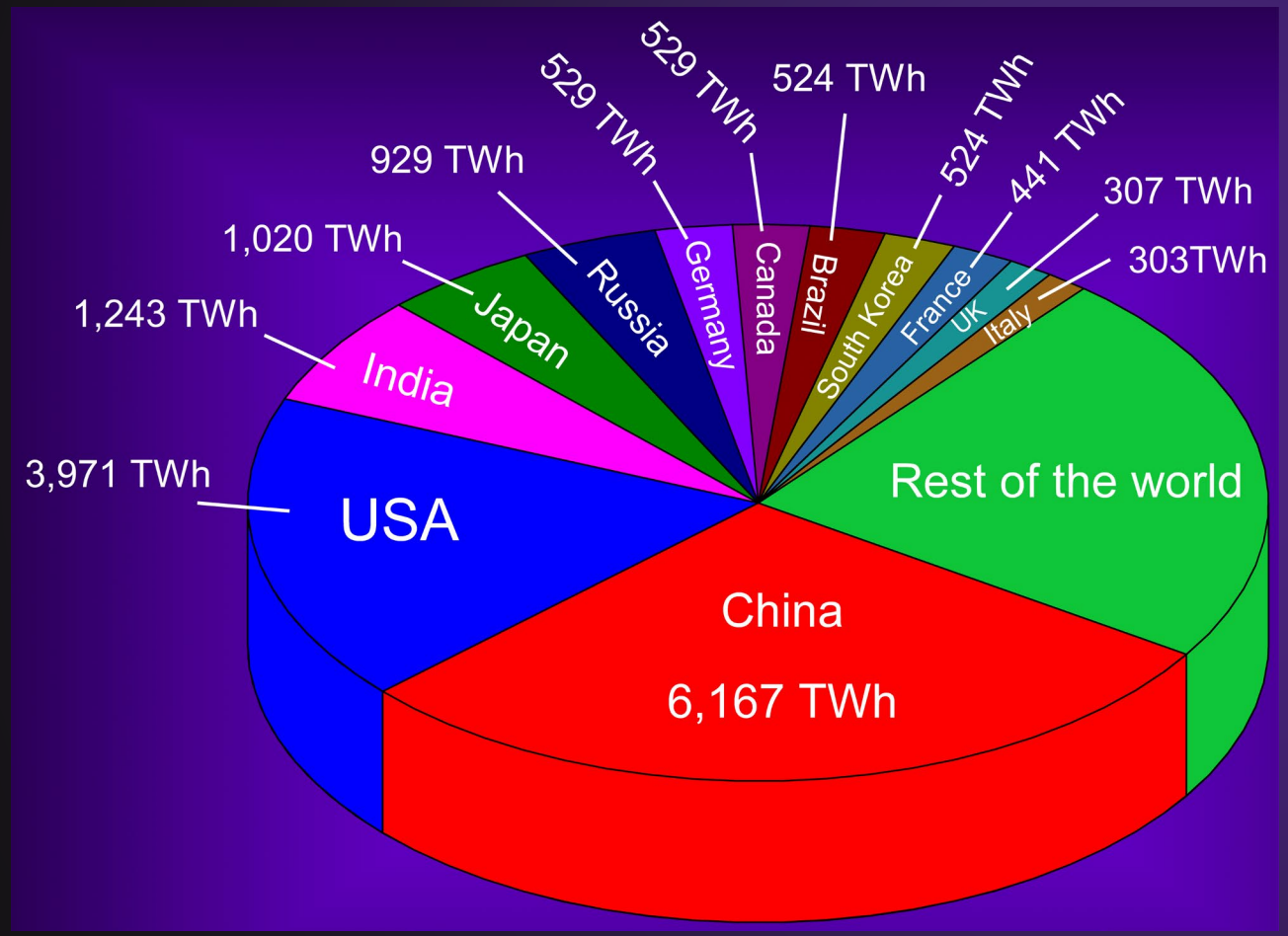
We consume so much of electricity

Electricity consumption in terawatt-hour (TWh)



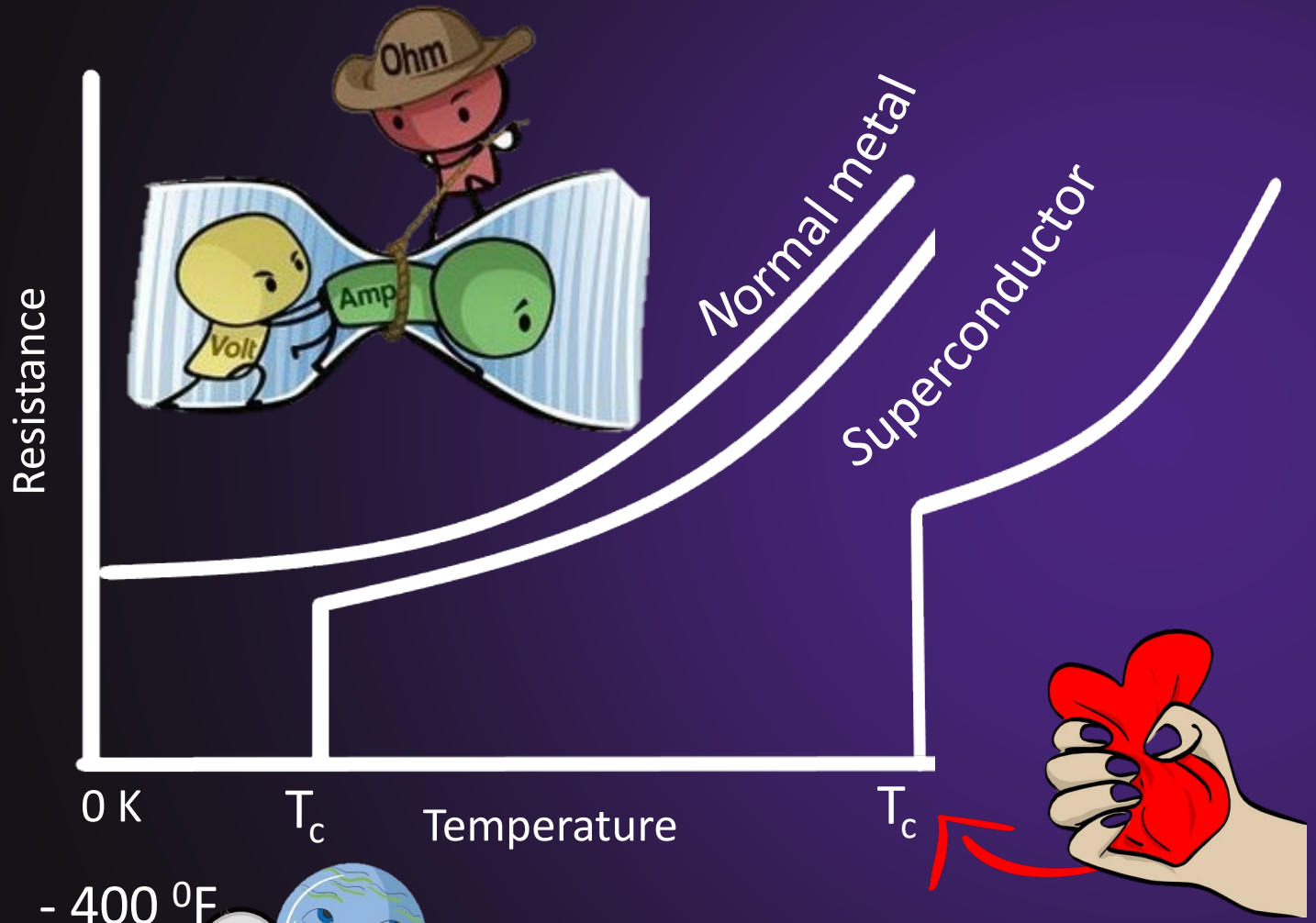
8 --10% loss due to electrical resistance of Copper wires

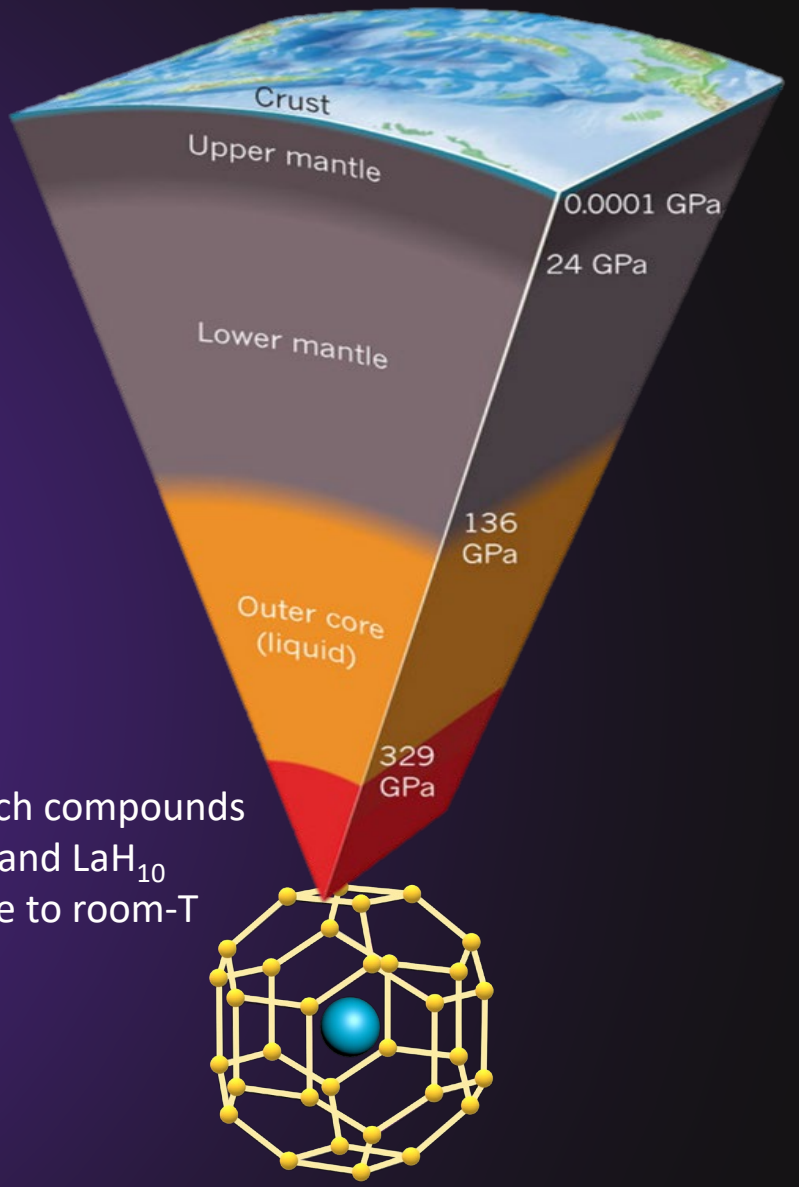
A **terawatt-hour** is a unit of energy equal to outputting one trillion watts for one **hour**.

Source: Enerdata database: https://yearbook.enerdata.net/

Superconductors: one way to save electricity

Electrical resistance ~ friction to the flow of electric current

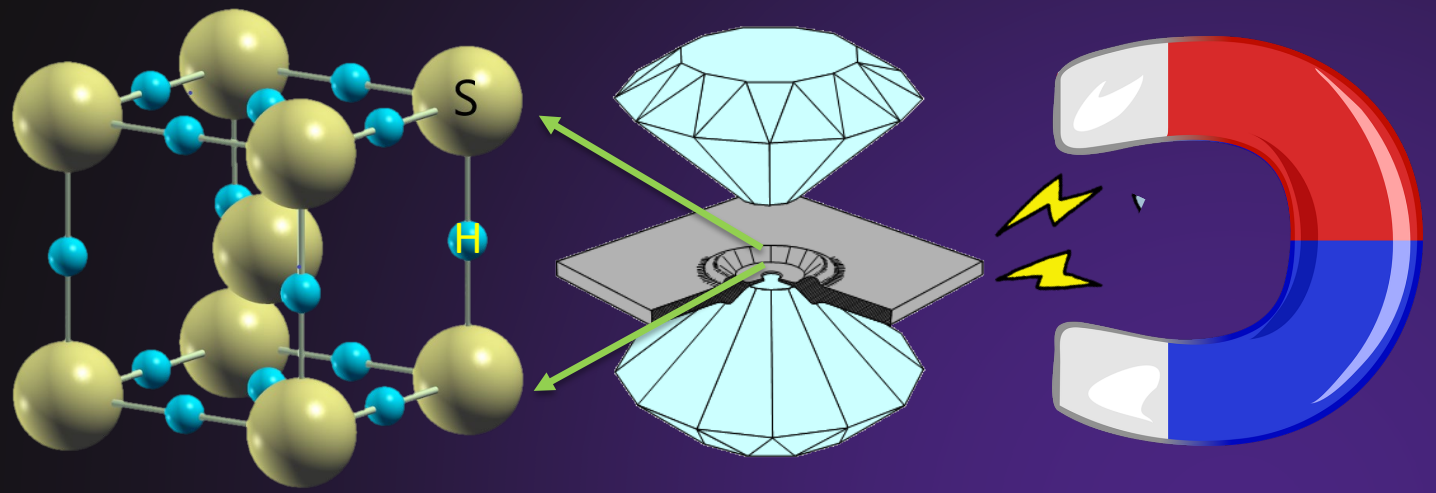


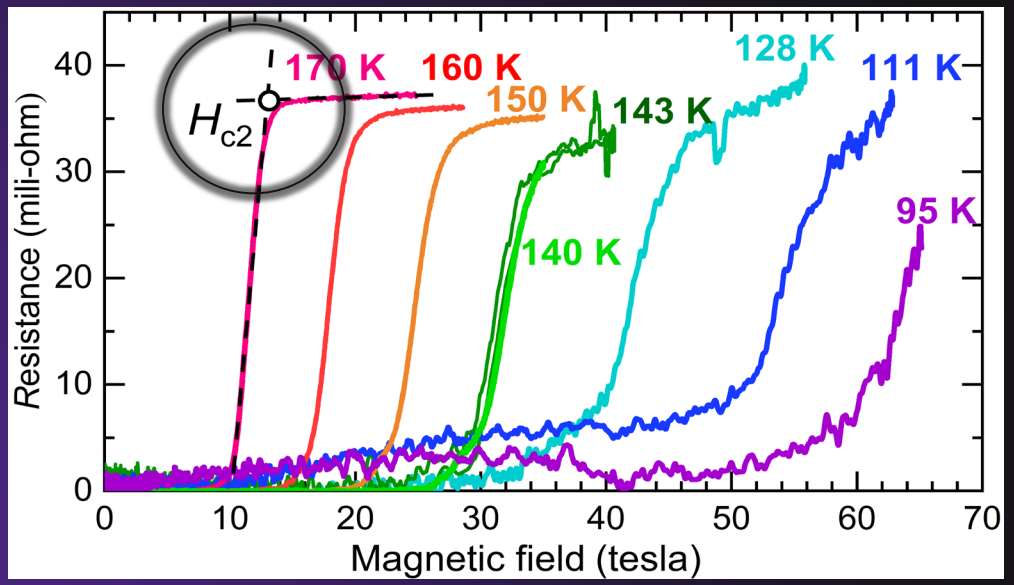


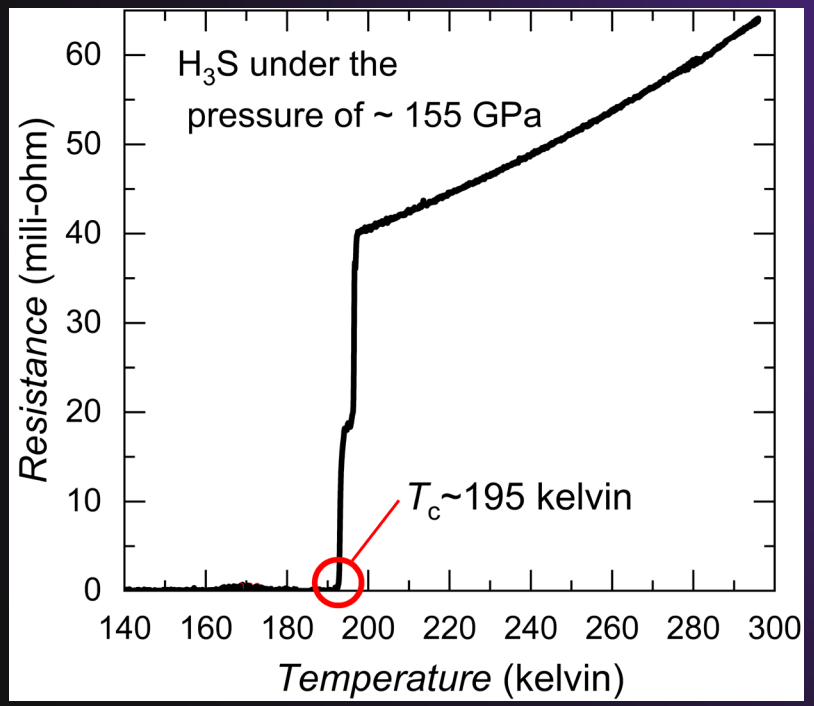
Hydrogen rich compounds such as H_3S and LaH_{10} have T_c close to room-T

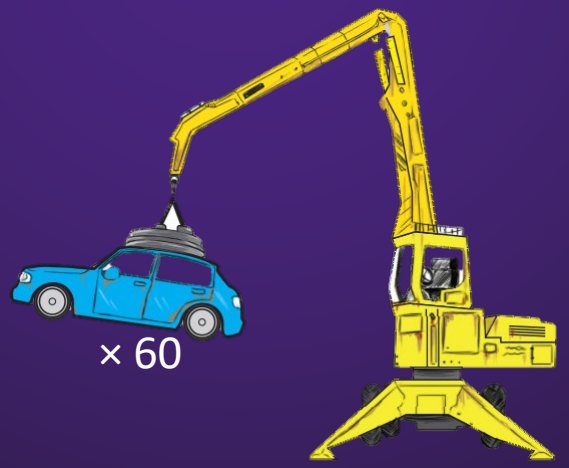
Under pressures on the order of pressure at the earth's center

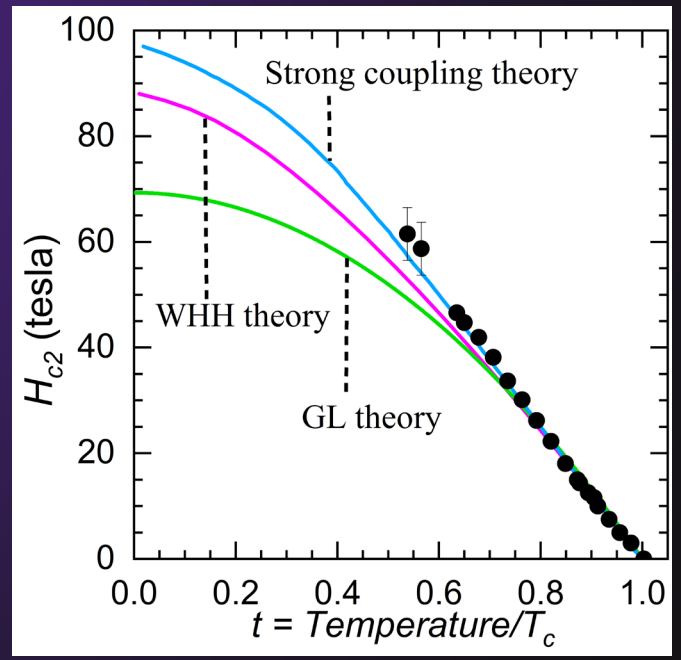
H_3S (hydrogen sulfide) under a record-high combination of pressure and magnetic field







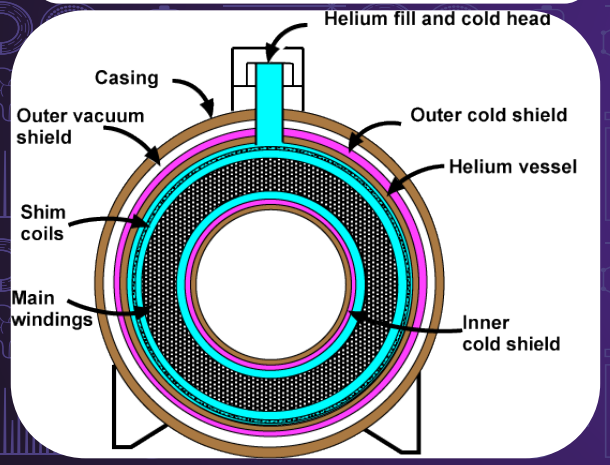


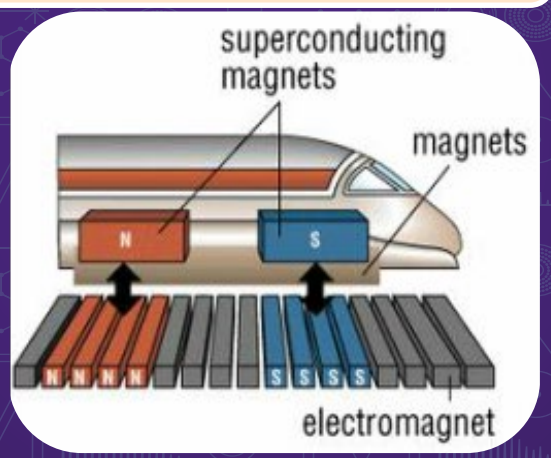


S. Mozaffari et al. *Nature Communications* **10**, 2522 (2019)

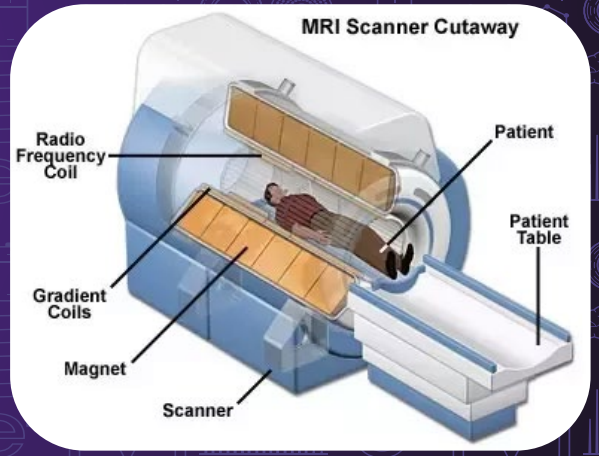
A room-temperature superconductor will facilitate applications

Fundamental Research	Energy & Technology	Medical Instrumentations
•Very strong magnets •Particle Colliders	•Superconducting wires •Maglev train	•Particle therapy •MRI





Speed ~ 300 miles/hour



Thank you for your attention!

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