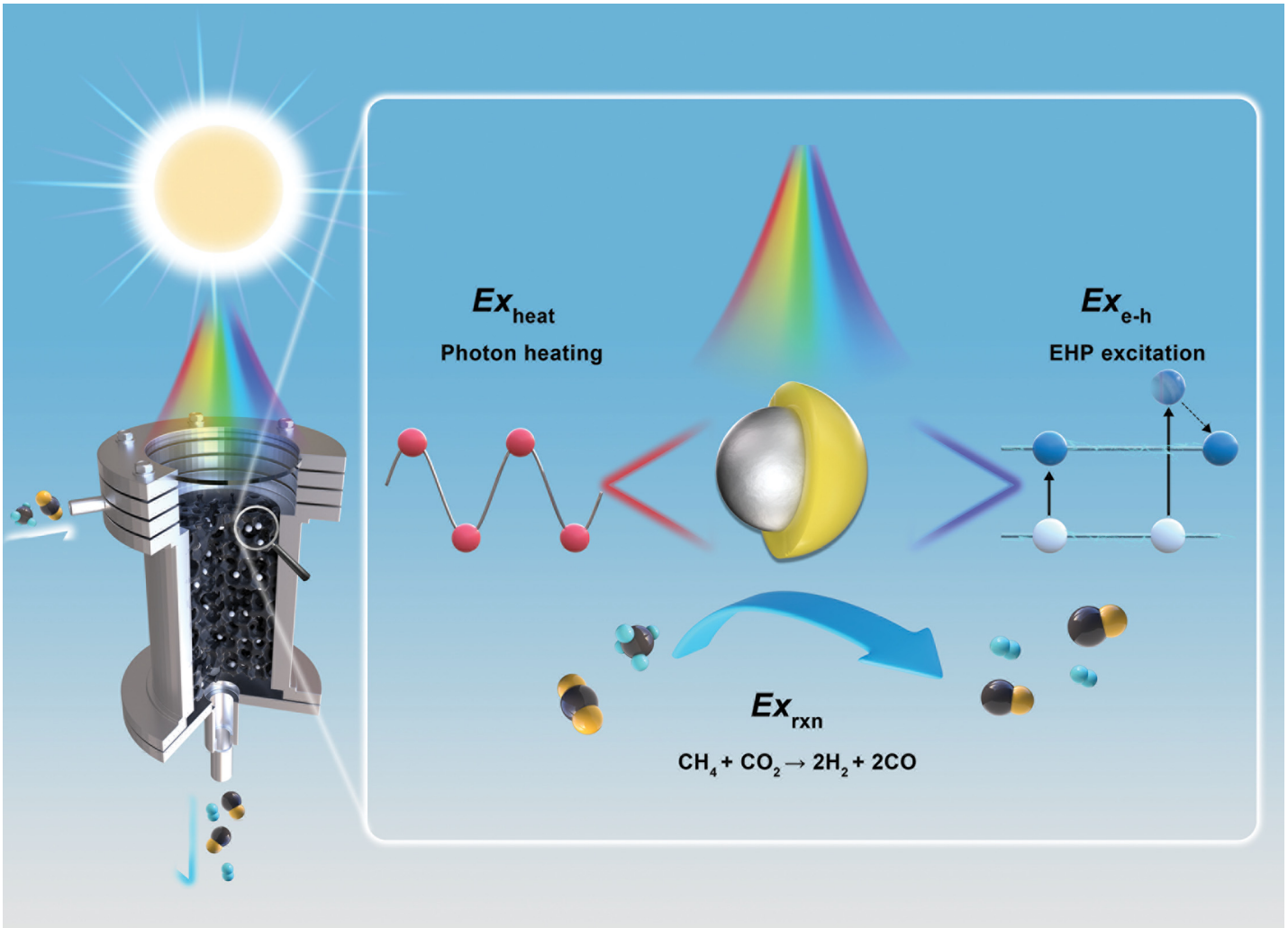

Showcasing research from Professor Dong Liu's laboratory, School of Energy and Power Engineering, Nanjing University of Science and Technology, Nanjing, China.

Photothermal catalysis: a viewpoint from exergy

We discuss the theoretical limits and thermodynamic mechanisms of photothermal catalysis, and identify prospective research directions, by developing an exergy balance model. We elucidated how the thermodynamic and realistic limiting efficiencies are related to the extraction of exergy from photons with different wavelengths, and to the need of exergy required by the reaction system. We show that photothermal catalysis is not a simple summation of photo- and thermo-catalysis. The limiting efficiencies are also contextualized by comparing to the reported experimental efficiencies, highlighting the importance of reactor design for photothermal catalysis.

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See Dong Liu, Yimin Xuan *et al.*, *Energy Environ. Sci.*, 2025, **18**, 9302.

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