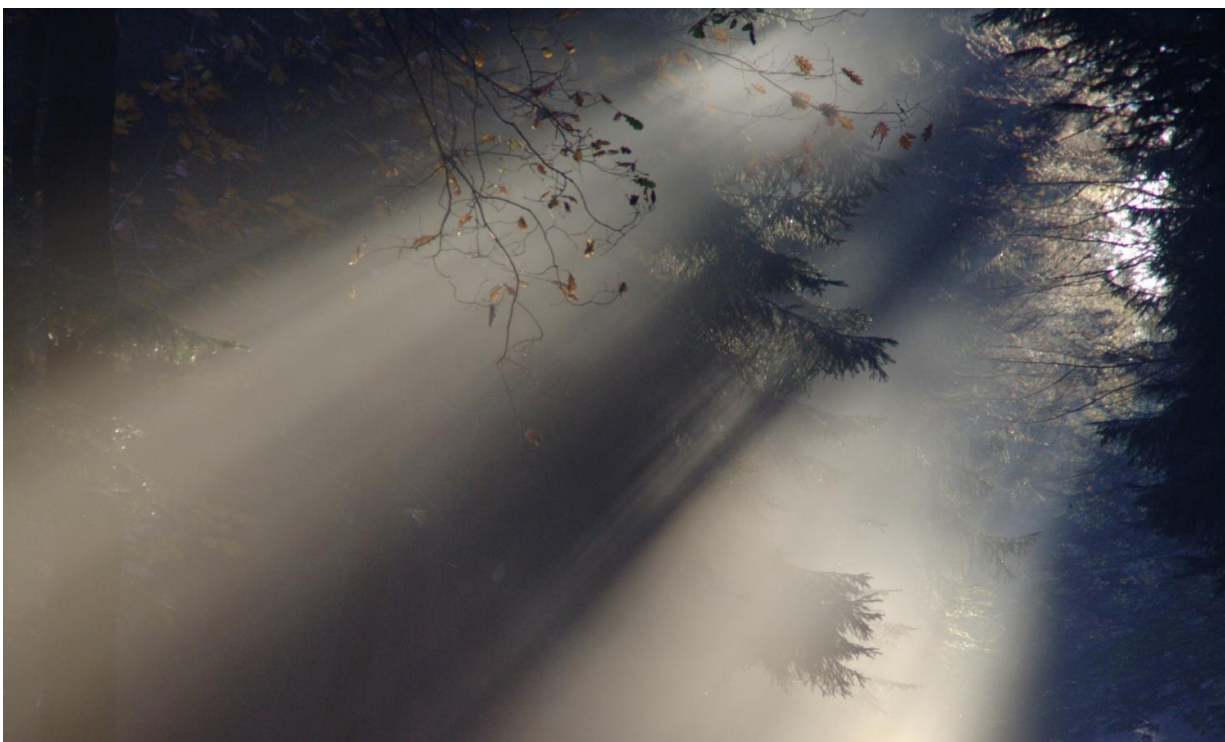


New study refutes theory on transfer of light energy

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A new study in *The Journal of Organic Chemistry* refutes a theory on the transfer of light energy.

When light meets matter—say, sunlight striking the surface of the Earth—it is mostly absorbed and quickly converted into heat. In some

cases, however, the light energy is also passed between [molecular structures](#), when a pigment excited by the light transfers the energy to another pigment. An example of this process is photosynthesis.

Numerous technological developments use this energy transfer, for which the physical chemist Theodor Förster developed a theory some 70 years ago. According to Förster resonance [energy transfer](#) (FRET), the [light energy](#) is transferred without radiation through resonance via small molecular dipole antennas—that is to say, electromagnetic interactions.

LMU chemist Prof. Heinz Langhals has now experimentally refuted this theory using the synthesis of test molecules. His results show that the energy is actually transferred via [molecular vibrations](#)—akin to how a stage floor can carry the vibrations of a grand piano to a cello standing on the platform. This process can reach all the way down into nano dimensions, and the chemist thinks it will be particularly interesting for the further development of optical technologies.

More information: Heinz Langhals et al, Vibronic Intramolecular Resonant Energy Transfer along More than 5 nm: Synthesis of Dyads for a Re-Examination of the Distance Function of FRET, *The Journal of Organic Chemistry* (2022). [DOI: 10.1021/acs.joc.1c02682](https://doi.org/10.1021/acs.joc.1c02682)

Provided by Ludwig Maximilian University of Munich

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