



## IMPRS UFAST Call for PhD applications 2020/2021



### Light-induced superconductivity in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ high- $T_c$ superconductors

A. Cavalleri-3

<b>Title of PhD Project</b>	<b>Light-induced superconductivity in <math>\text{YBa}_2\text{Cu}_3\text{O}_{6+x}</math> high-<math>T_c</math> superconductors</b>
<b>Type</b>	Experimental
<b>Supervisor(s)</b>	Prof. Andrea Cavalleri Dr. Michael Först
<b>Affiliation(s):</b>	Max Planck Institute for the Structure and Dynamics of Matter
<b>Number of positions:</b>	1
<b>Abstract:</b>	<p>Intense mid-infrared excitation of high-<math>T_c</math> cuprates has been shown to induce transient superconducting behavior above the thermodynamic transition temperature, evidenced by time-resolved THz spectroscopy of the non-equilibrium state.</p> <p>We seek to deepen our understanding of this exotic phenomenon by the use of alternative probing techniques that allow to gain insight into the dynamics of charges and spins on the femtosecond time scale. Time-resolved second-harmonic generation could be used to directly measure optically induced supercurrents, whilst femtosecond stimulated Raman spectroscopy could detect modulations of the exchange interactions through changes of bi-magnon peaks in the Raman spectra. Performing such experiments in the presence of static magnetic fields would then be a next step.</p> <p>We are offering a PhD position in this project, giving you the change to setup and perform these state-of-the-art experiments and contribute to our understanding of light-induced superconductivity in the cuprates.</p>
<b>Contact person for scientific questions about the project:</b>	Andrea Cavalleri: <a href="mailto:andrea.cavalleri@mpsd.mpg.de">andrea.cavalleri@mpsd.mpg.de</a>  Michael Först: <a href="mailto:michael.foerst@mpsd.mpg.de">michael.foerst@mpsd.mpg.de</a>