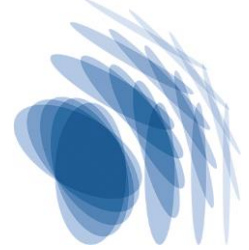


# Max-Planck-Institut für Struktur und Dynamik der Materie

Max Planck Institute for the Structure and Dynamics of Matter



**IMPRS UFAST Call for PhD applications 2023/2024**



**AC3-Nonlinear Two-Dimensional Spectroscopy of Driven Quantum Materials**

<b>Title of PhD Project</b>	<b>Nonlinear Two-Dimensional Spectroscopy of Driven Quantum Materials</b>
<b>Type</b>	Experimental
<b>Supervisor(s)</b>	Prof. Andrea Cavalleri
<b>Affiliation(s):</b>	Max Planck Institute for the Structure and Dynamics of Matter
<b>Number of positions:</b>	1
<b>Abstract:</b>	<p>The resonant excitation of terahertz-frequency optical phonons in quantum materials has been shown to induce a number of non-equilibrium phenomena, including enhanced magnetism, ferroelectricity and superconductivity. The mechanisms underlying these responses often involve nonlinear coupling between multiple coherent modes at once, which are difficult to disentangle with conventional pump probe spectroscopy.</p> <p>In this project, we seek to apply nonlinear two-dimensional spectroscopy to understand the coherent couplings among the symmetry-breaking modes that drive the exotic phenomena observed. We resonantly excite the optical phonons in these materials with pairs of carrier-envelope phase stable terahertz or mid-infrared pulses and isolate the nonlinear coherent response using second harmonic generation from time-delayed near infrared probe pulses.</p> <p>We offer a PhD position in this project, giving you the chance to push the technological limits of ultrafast spectroscopies and to perform these state-of-the-art experiments while contributing to our understanding of quantum materials.</p>
<b>Contact person for scientific questions about the project:</b>	Prof. Andrea Cavalleri: <a href="mailto:andrea.cavalleri@mpsd.mpg.de">andrea.cavalleri@mpsd.mpg.de</a> Dr. Michele Buzzi: <a href="mailto:michael.foerst@mpsd.mpg.de">michael.foerst@mpsd.mpg.de</a>

