



## IMPRS UFAST Call for PhD applications 2020/2021



### Time resolved crystallography of photoenzymes: protein-mediated catalysis at chemical resolution

#### T. Lane-1

<b>Title of PhD Project</b>	<b>Time resolved crystallography of photoenzymes: protein-mediated catalysis at chemical resolution</b>
<b>Type</b>	Experimental
<b>Supervisor(s)</b>	Dr. Thomas Lane
<b>Affiliation(s):</b>	DESY
<b>Number of positions:</b>	1
<b>Abstract:</b>	<p>Enzymes are the best performing catalysts on Earth, but how this remarkable performance is achieved remains a mystery. One key question we aim to answer is: what role do large-scale protein dynamics play in local chemical rearrangements (bond making or breaking)? New x-ray free electron laser (XFEL) technology allows us to directly image proteins at the time and length-scales (Ångstrom/femtosecond) on which chemistry occurs, making it possible to directly study enzyme catalyzed reactions via imaging.</p> <p>The photobiology group led by TJ Lane at CFEL seeks a candidate conduct this work, starting with DNA photolyase, an enzyme that elegantly uses light to repair sunlight-induced DNA damage. As the ideal candidate, you will use large x-ray facilities to make movies of photolyase and other systems at atomic resolution, enabling us to understand how these amazing machines work with unprecedented detail.</p> <p>As part of this PhD, you will get the chance to:</p> <ul style="list-style-type: none"><li>— Prepare protein crystal samples (protein expression, purification, crystallization)</li><li>— Interpret and analyze crystallography and other data</li><li>— Learn about XFELs and lasers</li><li>— Lead teams of 2-20 people to conduct XFEL beamtimes</li><li>— Help to foster an environment conducive to collaboration, learning, growth, and fun</li></ul>
<b>Contact person for scientific questions about the project:</b>	Thomas Lane: <a href="mailto:thomas.lane@desy.de">thomas.lane@desy.de</a>  See also: <a href="http://pbio.cfel.de">pbio.cfel.de</a>