



### PhD Opportunity in **Light-assisted Crystallisation of Proteins**

We are seeking applications from candidates for a 3 year PhD studentship in the area of light-assisted crystallisation of proteins, to be co-supervised by Jan Korvink and visiting Humboldt Fellow Andrew Forbes, together with IMT group leaders Dr Neil MacKinnon and Dr. Ian Howard.

Recently it has been shown that transitions from disorder to order of solvated molecules can be driven by coherent light, localising the metastable zone at the edge of a focal spot, thereby enabling control over the organic crystallization process, and removing the strong dependence on super-saturation for the nucleation of macromolecular crystals, see: Tominaga et al 2016, Promotion of protein crystal growth by actively switching crystal growth mode via femtosecond laser ablation, Nature Photon 10, 723-726.

In the current project we want to build upon these initial discoveries and develop greater control over this light-induced crystallisation process through the use of structured light, i.e., light tailored in 3D and in all its degrees of freedom, see: [https://www.osa-opn.org/home/articles/volume\\_31/june\\_2020/features/structured\\_light\\_tailored\\_for\\_purpose/](https://www.osa-opn.org/home/articles/volume_31/june_2020/features/structured_light_tailored_for_purpose/).

Through these developments, our goal is to achieve unprecedented control over the creation of crystals of arbitrary shape. The vision is to develop a light-induced crystalization apparatus to effectively "3D print" functional organic crystals on the microscale, using structured light to structure matter. Ultimately, such an ability to design and produce arbitrarily micro-structured functional organic crystals would provide a much-desired bridging technology between micro electro-mechanical systems and the biological world. Applications would include, but are not limited to, medical sensing and therapeutics. The successful candidate will work at the Institute of Microstructure Technology, with its excellent micro and nano structuring infrastructure, will be admitted to the Karlsruhe School of Optics and Photonics, and will be registered in the Faculty of Mechanical Engineering.

To Apply: apply through the KSOP PhD application portal with the reference number **KSOP-2020-05**.

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