



PhD position in biophysics at the Institute for Structural Biology, Grenoble, France.

**MANIPULATING FLUOROPHORE PHOTOPHYSICS TO BOOST SINGLE-PARTICLE TRACKING
PHOTO-ACTIVATED LOCALIZATION MICROSCOPY.**

The recruited student will investigate the photophysical behaviour of fluorophores, notably phototransformable fluorescent proteins, in the context of sptPALM. The goal will be to engineer enhanced variants or optimize illumination conditions to increase the single-molecule track lengths. The results will be applied to several biological projects.

Fluorescence nanoscopy bridges cellular and structural biology. In particular, single-molecule localization techniques such as PALM and STORM provide nanoscale pictures of biological targets *in cellulo*, either static or dynamic. This project focuses on the dynamic picture, by introducing specific developments of single-particle-tracking approaches based on the use of phototransformable fluorescent probes. Typically, these probes exhibit a highly complex photophysical behaviour: they “blink” and “bleach”, meaning that single-particle tracks are discontinuous and of limited length. The knowledge of fluorescent protein photophysics that we have developed in our team offers new strategies to obtain longer and more continuous tracks, providing more information on the dynamic behaviour of the studied targets, related to e.g. binding, unbinding or changes in diffusion regimes (De Zitter *et al*, Nature Methods, in press, see BioRxiv, DOI: 10.1101/475939). These developments form the basis of the proposed subject. The work will be carried out in the frame of well-defined biological projects with 4 collaborating teams at the IBS. Dynamics of the peptidoglycan synthesis machinery and of nucleoid associated proteins will be studied in bacterial cells while that of heparan sulfates and of the efferocytosis machinery will be investigated in mammalian cells.

Grenoble is situated in the middle of the beautiful French Alps, and the IBS provides a unique environment for state-of-the-art integrated cellular and structural biology (<http://www.ibs.fr/>).

Candidates should have a strong background in biophysics and/or biochemistry. Preliminary experience in advanced optical microscopy, protein crystallography or molecular biology will be key advantages.

The project is financed by the GRAL Labex: see <https://www.labex-gral.fr/gral-research-proposal-for-phd-projects/>

Applications are now open. Please send a CV, a motivation letter and at least one reference letter to Dominique Bourgeois (dominique.bourgeois@ibs.fr), **before June 20, 2019.**

