

## PhD Scholarship in Squirrel Dynamics

**Description:** This project investigates the dynamics of squirrels.

Understanding the dynamics of squirrels has become a focus for research in recent years. In the UK and Ireland interest in the topic is motivated by a quest to understand data gathered over the last few years on interactions between grey and red squirrels and pine martens. It has been observed that where the latter populations increase, the greys tend to be adversely impacted compared to the indigenous red squirrel. Thus knowledge of squirrel dynamics is important for answering questions related to that phenomenon in addition to other related questions. This PhD project involves multi-disciplinary research and we will work in collaboration with animal behaviourists at Exeter University.

The outcomes of this project for the PhD candidate are listed below:

- A) Understand the determinants that govern the domain of a canopy that a squirrel can safely access.
- B) Knowledge, for all positions along a branch, of the jumping trajectories of the squirrel i.e., the direction and range of trajectories when the squirrel jumps from a branch.
- C) Knowledge of the impulse/momentum involved in squirrel jumping.

The research involves experimental, analytical, and numerical work, revolving around engineering theories for the mechanics of jumping from rigid platforms and from long slender elastic rods undergoing large deformations (tree branches). The student will receive training in the use of a force platform, programming using software (MATLAB or similar), in advanced analytical skills and in experimental techniques, procedures, and specifications.

The student will subsequently develop each of those skill areas and assist in the design and implementation of experiments, during his/her research. The student will also gain expertise in geometrically nonlinear elastic rod theory (Cosserat theory), which has a very wide range of applications in engineering, and bioengineering. Applicants must be equipped with a solid foundation in engineering mechanics.

**Supervisory Team:** The successful applicant will be working with Dr Geoff Goss. Informal enquiries should be directed to Dr Geoff Goss ([gossga@lsbu.ac.uk](mailto:gossga@lsbu.ac.uk)) or second supervisor Dr Hamed Rajabi ([rajabih@lsbu.ac.uk](mailto:rajabih@lsbu.ac.uk)). Please send a copy of your CV with a covering letter directly to Dr Geoff Goss before applying.

**Requirements:** Enthusiastic and self-motivated candidates from all countries with a background in either Mechanical Engineering, Biomechanics, Physics or a related discipline are encouraged to apply. A good knowledge or experience in dynamics is recommended. Applicants must be of outstanding academic merit and should have (or be expected to gain) either a first class or an upper second class Honours degree (or the international equivalent). An MSc/MRes is advantageous.

This PhD is a School of Engineering Bursary covering fees and a £18k stipend per annum for three years. As part of the candidate's academic development, the bursary agreement includes that the successful PhD candidate engages in 4 hours per week student contact time, comprising lab class assistance and extracurricular activity development. If you have any informal query, please email the supervision team directly. We encourage applications from underrepresented groups.