

UROP Studentships for MAGPIE Plasma Physics Laboratory, Summer 2019

Open to: All Years

How many: 2 students

Length: 8-10 weeks

Bursary: £300/week

Closing date for applications: Wednesday 13th February

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Description

Solar flares, young stellar jets and the unstable accretion disks around black holes are some of the most energetic and spectacular events in the universe. To aid our understanding of the physics governing these phenomena we can employ laboratory experiments to create similar high-energy-density plasma conditions on Earth. The MAGPIE facility at Imperial College London specialises in “laboratory astrophysics” experiments of this kind. It comprises of a house sized generator in the basement of the Physics Department, which delivers a pulsed electrical current of 1 MA in 250 ns. This converts solid material into plasmas at temperatures of over 1 million Kelvin and simultaneously creates intense magnetic fields which are an integral ingredient of space environments. The plasmas can be launched to form centimetre scale flares, jets and accretion discs, whose interactions are studied in detail using a platform of laser probing and imaging diagnostic tools.

We are looking for 2 students this summer to work as part of the MAGPIE team. You will be working on experiments aimed at understanding processes such as jet formation, magnetic reconnection and bow shocks relevant to young stellar jets, the solar wind and the Earth’s magnetosphere. Applicants should be practically minded, keen to experiment, good at working as part of a large team and patient with the inevitable delays associated with cutting edge laboratory research. Knowledge of plasma physics is not necessary, but applicants should have experience with electronics, oscilloscopes and optics, as well as programming in Python or Matlab.

[1] “Why space weather is being made in the lab”, National Geographic (2018) <https://www.nationalgeographic.co.uk/space/2018/11/why-space-weather-being-made-lab>

[2] J.D. Hare, L.G. Suttle *et al.*, [Physics of Plasmas](#) (2018)

[3] F. Suzuki-Vidal, S.V. Lebedev *et al.*, [The Astrophysical Journal](#) (2015)