Undergraduate research internship

NSTX-Upgrade at Princeton plasma Physics Laboratory is the largest spherical tokamak in USA and is scheduled to start operations in 2022 to explore the frontiers of magnetized fusion. It will maintain hot plasma at temperatures exceeding ten million degrees at its core. The hot plasma in the experiment can rapidly cool down if impurities reach the core and then radiate X-rays. Thus, monitoring the X-ray emission from plasma is extremely important to understand and limit the transport of impurities to the hot core of the experiment. The plasma spectroscopy group at Johns Hopkins University is responsible for various diagnostics on the NSTX upgrade experiment, which cover the Extreme ultraviolet and soft X-ray regions [1,2,3].

We seek a motivated undergraduate research intern who will work with other members of the group to design and build an upgraded imaging spectrometer in the extreme ultraviolet. The work will include (a) Commissioning a Penning discharge source at the Homewood campus, (b) design and assembly of upgraded spectrometer, and testing its performance on the Penning source and (c) installation and use of the spectrometer on the NSTX-Upgrade experiment in Princeton, NJ.

Desired qualifications – Undergraduate student willing to commit 10 hours per week for the fall and spring semesters. We seek students from Physics and Engineering majors. Prior exposure to design, electronics, and data analysis is a plus.
Compensation: Greater than $15 an hour, with a possibility of increasing with time.

If interested, please contact Dr. Deepak Batheja < deepak.kumar@jhu.edu > and/or Dr. Kevin Tritz < ktritz@pppl.gov >. We look forward to hearing from you.

1. D. Kumar, A. Englesbe, M. Parman, D. Stutman, M. Finkenthal. Charge state distribution and emission characteristics in a table top reflex discharge - Effect of ion confinement and electrons accelerated across the sheath. Phys. Plasmas, 22, 113504 (2015).
2. D. Kumar M. Parman, D. Stutman and M. Finkenthal. Transmission grating based imaging spectrometers in the XUV and VUV for various plasmas. Journal of Instrumentation, 8, T10002 (2013).
3. D. Kumar, M. Finkenthal, D. Stutman, R. E. Bell, D. J. Clayton, A. Diallo, B. P. LeBlanc, M. Podesta and K. Tritz. Impurity analysis of NSTX using a transmission grating-based imaging spectrometer. Plasma Phys. Control. Fusion, 54, 065010 (2012)

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