Modelling conduction by non-thermal electrons in fusion plasmas

Project type: **Simulation**	Open to: **Undergraduates (years 2 & 3 preferred*)**
Location: **York Plasma Institute, University of York, York YO10 5DD**	
Duration: **8-10 weeks (June-Sept period, dates flexible)**	Bursary: **approx. £400/week (TBC)** funded by EPSRC AMPLIFI Prosperity Partnership with First Light Fusion
Application deadline: **Weds 26th April 2024, 4 pm**	Contact: **Chris Ridgers (christopher.ridgers@york.ac.uk**)

*Students must be enrolled in a degree program at the time of the placement (i.e. graduating 2025 or later). 4th year students accepted for 5-year degree programs.

Project description

Recent experiments in inertial-confinement fusion have demonstrated the important milestone of 'ignition' - more energy out from fusion than in the driver (a laser in this case). There are, however, important questions to answer if the required higher energy gain is to be achieved. One question is how to model electron thermal conduction. Electrons dominate thermal conduction in ICF plasmas and confining the heat is clearly crucial to achieving fusion conditions. The electrons are far from local thermodynamic equilibrium and so our models break down. This project will explore using our new model, which does not assume LTE to move towards solving this problem. This project will give you valuable skills in using large-scale simulation codes applied to fusion plasmas. Applications are welcomed from undergraduate students for the summer 2024.

Further reading

https://www.amplifi-partnership.org.uk/ and https://www.york.ac.uk/physics-engineering-technology/ypi/
https://lasers.llnl.gov/news/age-of-ignition