

Postgraduate Scholarship on Filamentary structure formation in astrophysical environment

Supervisor: Dr Jingqi Miao

A funded PhD position is available in the field of theoretical modelling of filamentary structure formation in astrophysical environment.

Our understanding of star formation from collapsing molecular clouds has been greatly advanced by the recent observations with the Herschel Space Observatory. It was revealed that: filamentary structures are omnipresent throughout the Galactic interstellar medium on all scales, and condensed molecular cores (seeds of stars) are embedded within the filaments. The filamentary networks formed in different astrophysical environment are of very different morphologies, which leads to different prospects of star formation. It is therefore the case that filament formation is a key stage in the conversion of molecular clouds into cluster of stars.

Theoretical modelling is essential to develop new insights into the physics of filament formation, fragmentation and further evolution in different physical environment, especially the central role of filaments in the rapid gathering of gas into a star cluster. We are going to develop a comprehensive hydrodynamic model to address the answers to the following questions: 1) what is the criteria to distinguish star forming filament from that which will never form stars? 2) what physical mechanism leads to the observed unique distribution of the width of filaments; 3) what physical parameters determine the morphology of a filamentary network and the distribution of dense core and their masses?

In summary this project is to use numerical simulations to investigate the role of various physical processes in the formation and evolution of filamentary structures in molecular clouds and to update our understanding on the role of filaments in star formation and to provide astronomers with a physical interpretation of the observations by the Herschel

This is an opportunity to obtain the modern knowledge on star and galaxy formation and develop multi-skills such as computer programming, data analysis, more importantly, the ability of doing independent and advanced research in astrophysics. Successfully accomplishing this project will set the candidate a solid foundation for future academic or industrial career development.

The successful candidate will be based at the University of Kent's main campus in Canterbury as part of the Centre for Astronomy and Planetary Sciences (<http://astro.kent.ac.uk/index.html>), and work under the supervision of Dr Jingqi Miao (Kent).

This PhD Studentship is due to start in September 2016.

Entry requirements and Funding: Applicants should have or expect to obtain a first or upper second class honours degree (or equivalent) in e.g. Physics, Mathematics or a related subject. This is a Vice Chancellor's Research Scholarship, which will be offered at the standard UK Research Councils' rate (currently £14,296; to cover living costs) and will additionally cover tuition fees at the Home/EU rate

(currently £4,121 per annum) for three years. This scholarship is available to both UK and EU nationals and will involve undertaking teaching/demonstrating duties during the period of study.

Webpages:

<http://astro.kent.ac.uk/~jsu/index.html>

<http://www.kent.ac.uk/physical-sciences/staff/profiles/ingqi-miao.html>

Contact: For further information or informal enquiries, please contact: Dr Jingqi Miao (j.miao@kent.ac.uk).

How to Apply: To apply please go to: <http://www.kent.ac.uk/courses/postgrad/apply/index.html>.

You will need to apply through the online application form on the main University website. Please note that you will be expected to provide personal details, education and employment history and supporting documentation (Curriculum Vitae, transcript of results, two academic references).

Deadline Date for Applications: 6th May 2016

Interviews to be held between: 16th – 27th May 2016