



PhD Student (ESR in ITN GraWIToN) - Power Stabilisation-

The Max Planck Institute for Gravitational Physics (Albert Einstein Institute, AEI) [link](#)

was founded in 1995 by the Max Planck Society for the purpose of pursuing research into the fundamental laws of gravitation. The goal of all activities of the Laser Interferometry and Gravitational Wave Astronomy division is the detection of gravitational waves and the development of gravitational-wave astronomy. This comprises the development and operation of large gravitational-wave detectors on the ground as well as in space, but also a full range of supporting laboratory experiments in quantum optics, atomic physics, and laser physics. The AEI provided the stabilized laser systems for the Advanced LIGO Gravitational Wave Observatory and plays a worldwide leading role in the development of laser stabilization techniques for different applications.

A Initial Training Networks (ITN) [link](#)

is one of the European Marie Curie Actions. It aims to improve career perspectives of Early Stage Researchers (ESR) in both public and private sectors. This will be achieved through a trans-national networking mechanism, aimed at structuring the existing high-quality initial research training capacity throughout Member States and associated countries.

GraWIToN [link](#)

is an ITN, funded by European Commission under FP7-Marie Curie Actions for four years. The GraWIToN Project aims to train 13 young researchers (PhD students) in the field of gravitational wave search, which is a fast expanding field in modern physics. In fact, the GraWIToN ESR will most likely witness the first direct detection of Gravitational Waves by one of the currently commissioned Advanced Gravitational Wave Detectors. The young researchers will be embedded in this exciting research environment and will be trained in the cutting edge technologies important for future Gravitational Wave detectors and other optics experiments. The project links both academic and industrial partners offering experience in both environments and excellent opportunities for advancement. The network also includes an extensive training program consisting of schools, research activities and secondments in the labs of the participating partners. In addition to performing research and receiving training, GraWIToN ESRs are expected to promote science in the broader public, e.g. as so-called Marie Curie ambassadors in secondary schools.

This individual research project

will focus on the power stabilization of high-power lasers. Conventional power stabilization schemes are limited by the quantum noise (shot noise) of the detected light and hence by the maximal power photodiodes can handle. The goal of this research project it is to transfer the power noise information to an observable which can be sensed with higher accuracy than the light power fluctuations directly. Several transfer schemes will be studied and the most promising one will be used in a power stabilization experiment to demonstrate the concept and reach, or even exceed the highest power stabilities achieved with conventional methods.

(For more information see ESR9 under <http://www.aei.mpg.de/1509889/grawitonjobs>).

Training

of the ESRs is the main goal of the ITN. The ESR will have several theoretical and practical training opportunities. The theoretical training is comprised by local and network courses on Optics, Simulations, High Power Lasers, Data Analysis and Public Outreach. Complementary training technical areas and in presentation skills, scientific writing and project management is provided by the AEI's International Max-Planck Research School (IMPRS). As the AEI is fully integrated into several

large science projects the ESR will be exposed to several areas of modern physics by talks, workshops and conferences.

Most of the practical training will take part in the local laboratories of the AEI. With a large group of senior scientists, postdoctoral and doctoral researchers and students, the AEI forms a special environment to learn practical and experimental skills. The anticipated secondments of the ESR to private laser fabrication enterprises and other GraWIToN laboratories will allow the ESR to gain insight in the procedures and work environment of other institutions and industry.

The applicant (f/m)

- is expected to have achieved a **Master of Science (M.Sc.) Degree** or equivalent title in physics.
- must not have been awarded a doctorate degree and be in the first 4 years (full-time equivalent) of their research career.
- should be able to work effectively in teams, within an international environment, and has to be available to travel. The applicant should have excellent organizational, reporting and communication skills, as well as a proactive attitude towards solving of problems. A very good English level is essential.
- At the date of recruitment, applicants must not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months in the 3 years immediately prior to their recruitment. Compulsory national service and/or short stays such as holidays are not taken into account.

The position

is limited for three years. The ESR will be enrolled in the doctorate program of the Leibniz Universität Hannover and in the IMPRS. The ESR will receive a salary consistent with the ITN benefits (gross living allowance per year of €36.024 and a total mobility allowance per year from €7.963 up to €11.376 (depending on family status at the date of recruitment). The employment contract will have full social security coverage and is subject to national employment laws.

Application and Selection Process

Application should be send by email to Benno.Willke@aei.mpg.de

The application must include:

- a) Application form
- b) CV/résumé
- c) Copy of official transcripts (in English or German) detailing your university-level qualifications, the list of classes/exams successfully attended/passed and marks to date; final score and date of graduation. This should be produced for you as an official document by the institution where you studied.
- d) Two or more academic references which support intellectual ability, academic achievement, motivation, ability to work in a group.
- e) Declaration that the applicant have not resided or carried out his/her main activity in Germany for more than 12 months for the 3 years immediately prior to their recruitment.
- f) Declaration that the applicant has not been awarded a doctorate degree and he/she is in the first 4 years (full-time equivalent) of his/her research career.

The closing date for this application is 20 July 2014.

The selection will be based on the evaluation of the submitted documents by a GraWIToN selection committee. The committee will compile a short list of candidates which will be invited to an interview by a local AEI selection committee. Eligible candidates will be informed by e-mail about the results of the competition and will be asked to confirm acceptance of the fellowship within 15 days. In case of lack of response by that date, the fellowship will be assigned to the next eligible candidate in the ranking list.

The GraWIToN project endeavours to employ a higher proportion of female research staff. Female candidates are therefore highly encouraged to apply.

For further information please contact: Harald.Lück@aei.mpg.de or Benno.Willke@aei.mpg.de