

Buried heterostructures in generic photonic technology for efficient WDM transmitters

TU/e and III-V Lab provide a joint PhD training environment for three PhD researchers to develop and study generic technologies for next generation WDM transmitter technology. This is in the framework of a recently awarded Marie Curie Initial Training Network project.

http://ec.europa.eu/research/mariecurieactions/about-mca/actions/itn/index_en.htm

The Technical University of Eindhoven is leading in the field of Photonic Integration Technology. It has the world's best equipped university cleanroom for photonic integration. www.tue.nl/nanolab/ The Department of Electrical Engineering is one of the nine departments of the Eindhoven University of Technology and provides BSc and MSc programs in Electrical Engineering. The department has nine research groups and has research collaborations with other departments at the Eindhoven University of Technology as well as with a large number of other universities and companies, both within the Netherlands and internationally. The department has approximately 350 employees and 600 students. The Photonics Integration research group at TU/e is within the COBRA institute. www.tue.nl/cobra/

III-V Lab is an industrial Research Laboratory jointly established by Alcatel-Lucent, Thales and CEA Leti. Under the guidance of its members, III-V Lab conducts R&D activities in the field of micro/nano-electronics and photonics semiconductor components for different application: telecoms, defence, security, safety, space etc. These activities cover the topics including (1) Photonic Integrated Circuits (PICs) for telecoms, (2) Micro/nano-electronic circuits for telecoms: 40Gb/s, 100Gb/s and over, (3) GaN microelectronic circuits for microwave and power applications, (4) High resolution infrared imagery sensors, (5) Quantum cascade lasers (QCLs) and power lasers.

III-V Lab has established experience in industrial research and development and provides an ideal environment for Ph.D candidates who are willing to be trained to work in industries. <http://www.3-5lab.fr/>

Three different PhD positions are offered within the Initial Training Network. Each PhD student position will be based for two years at TU/e in Eindhoven, The Netherlands and also for two years in III-V Lab in Palaiseau, France.

Research Challenges: Next generation wavelength multiplexed laser transmitter chips require epitaxially (re-)grown semiconductor wafers. In this project we will use advanced buried heterostructures to control current injection and confine light in the most efficient manner. This advanced technology development will take place in the facilities at III-V Lab for the required epitaxial layer stacks, and the Nanolab@TUE facilities to integrate with the generic integration process at TU/e. The objectives within this PhD project will be implementing and demonstrating buried heterostructure technology in building complex photonic integrated circuits for transmitters which will exploit phase modulation and further integration of transmitters and receivers.

The PhD student tasks: PhD researcher activities will focus on

- (a) Integrating a buried heterostructure semiconductor optical amplifier structure, developed at III-V Lab in the generic integration process of TU/e. This allows amplifiers and lasers with superior thermal and noise properties.

- (b) Transferring the experimental generic integration process at TU/e from I-line lithography (365 nm) to DUV lithography (193 nm) using COBRA's unique ASML scanner tool (PAS5500/1100). This will provide superior alignment accuracy, dimension control and resolution, about three times better than the best tools (I-line steppers) that are currently available for 3" InP wafers. This leads to lower optical losses and enhanced performance in the integrated optical multiplexers and modulators.
- (c) Validate this new technology with advanced photonic integrated circuits which exploit phase modulators for data transmission and integration of transmitters and receivers.

Job requirements

- MSc degree in a relevant area of applied physics, optical science or electrical engineering
- A solid background in semiconductor opto-electronics
- Ability to work with experts from a broad range of scientific and technology backgrounds
- Fluent spoken and written English

Applicants may also advantageously have experience in one or more of the following areas

- Clean room technology
- Optical computer aided design software

Conditions of employment

We offer a challenging job at a dynamic and ambitious university through a fixed-term appointment for the period of 4 years. The research in this project must be concluded with the attainment of a PhD-degree. As an employee of the university you will receive a competitive salary as well as excellent employment conditions. A salary is offered starting at € 2083.- per month (gross) in the first year, increasing up to € 2664.- per month (gross) in the last year. Moreover, an 8% bonus share (holiday supplement) is provided annually. Assistance for finding accommodation can be given. The university offers an attractive package of fringe benefits such as excellent technical infrastructure, child care, savings schemes, and excellent sports facilities.

TU/e also offers you the opportunity for personal development by developing your professional skills. We do this by offering every PhD student a series of courses that are part of the Proof Program as an excellent addition to your scientific education.

More information on employment conditions can be found here: <http://w3.tue.nl/en/services/dpo/>.

Information and application

If you are interested in this research opportunity and you would like to informally discuss the project, please contact: Prof. Dr. Kevin Williams (tel: +31 40 247 4331; K.A.Williams@tue.nl) or Dr. Xaveer Leijtens (tel: +31 40 247 5112; X.J.M.Leijtens@tue.nl).

For information concerning employment conditions you can contact Mrs W. van Eck, HR advisor (w.w.k.v.eck@tue.nl).

Application

If interested, please use 'apply now' button at the top of this page. You should upload the following (all in English):

- a cover letter explaining your motivation and qualification for the position;
- a Curriculum Vitae including course grades, research project achievements and list of publications
- contact information for two referees.
- copies of diplomas
- proof of English language skills where applicable

Please keep file sizes small. Please keep in mind; you can upload only 5 documents up to 2 MB each.