Summer school on Defects in Semiconductors

Zhejiang University, China

6-10 July 2020, Hangzhou, China

The goal of the doctoral school is to introduce PhD students and researchers and engineers from industry to defects in semiconductors and their important impact on the characteristics of electronic devices and on the yield of wafer and device processing. All aspects of defects in semiconductors will be dealt with, ranging from fundamental aspects like their atomic structure, origin, electronic and optical properties, over the best suited characterization and simulation techniques, to their impact on devices and process yield including defect engineering. While most of the knowledge has been gained in the past on silicon materials and processing, there is a renewed strong interest in defect control and engineering, in order to add new functionalities on a silicon platform. The last two (2016 and 2018) summer schools were successfully held in Ghent, Belgium.

The 5-days doctoral school is divided into an Introductory Day (Tutorials) and 4 days of Lectures, which will be given by internationally renowned experts in the field. Charge-free registration is provided for PhD student participants and they are encouraged to make a poster to present and discuss their research.

The Tutorials cover the following topics:
Defects in semiconductors: basic definitions and structural and electrical properties
Defects characterization techniques
Basic of semiconductor devices
Basic of semiconductor processing steps

The Lectures include:
Defects in substrates and epitaxial layers
Processing-induced defects and defect engineering
Interface and bulk defects – impact on devices
Impact of defects on electrical performance

For more information and preregistration, please visit the website:
http://sigroup.zju.edu.cn/scod/ which can be accessed in the middle of this February.

International Scientific Committee:
Prof. C. Claeys (KU Leuven, Belgium)
Prof. E. Simoen (Ghent University, Belgium)
Prof. E. Gaubas, (Vilnius University, Lithuania)
Dr. G. Kissinger (IHP, Frankfurt/Oder, Germany)
Prof. J. Murphy (Warwick University, UK)
Prof. K. Sueoka (Okayama Prefectural Univ., Japan)
Prof. D. Yang (Zhejiang University, China)

Local Organizing Committee:
Prof. Deren Yang
Prof. Xiangyang Ma
Prof. Xuegong Yu
Dr. Yanjun Fang
Dr. Wei Sun

Monday 6 July: Tutorials

08.45-09.00 : Welcome and introductory remarks (Yang/Henk Vrielinck)
09.00-10.00 : Defects in semiconductors: basic definitions and structural properties(Cor Claeys)
10.00-10.30 : Break
10.30-11.30 : Defects in semiconductors: electrical properties (Henk Vrielinck)
11.30-12.30 :Transmission electron microscopy as a characterization tool for semiconductor devices (Chuanhong Jin)
12.30-14.00 : Lunch
14.00-15.00 : Basics of semiconductor devices (Eddy Simoen)
15.00-16.00 : Basics processing steps Part I (Rita Rooyackers)
16.00-16.30 : Break
16.30-17.30 : Basic processing steps Part II (Rita Rooyackers)

Tuesday 7 July: Defects in substrates and Epitaxial Layers

08.45-09.00 : Welcome and introductory remarks (Yang)
09.00-10.00 : Grown-in defects in semiconductor substrates (Cor Claeys)
10.00-10.30 : Break
10.30-11.30 : Introduction to epitaxial growth (Henry Radamson)
11.30-12.30 : Grown-in defects in hetero-epitaxy on silicon and their control (Henry Radamson)
12.30-14.00 : Lunch
14.00-15.00 : Defects in mc-Si for photovoltaics (Lihui Song)
15.00-16.00 : Defects in III-N materials (Takashi Sekiguch)
16:00-16.30 : Break
16.30-17.30 : EBIC and CL to study defects in Semiconductors (Takashi Sekiguch)

Wednesday 8 July: Processing-induced defects

09.00-10.00 : Defects in wafer thermal processing (Gudrun Kissinger)
10.00-10.30 : Break
10.30-11.30 : Shallow junction defects (Eddy Simoen)
11.30-12.30 : Metal contacts and conformal coating technology (Christophe Detavernier)
12.30-14.00 : Lunch
14.00-15.00 : Isolation-induced defects (Rita Rooyackers)
15.00-17:30: Poster presentation (I)

Thursday 9 July: Morning - Interfaces and 2D materials characterization

09.00-10.00 : Interface and oxide defects – electrical characterization (Qi Wang)
10.00-10.30 : Break
10.30-11.30 : Surface passivation (Qi Wang)
11.30-12.30 : Characterisation of 2D materials with transmission electron microscopy(Chuanhong Jin)

Afternoon-Defect Engineering

14.00-15.00 : Processing-induced metal contamination (Cor)

15.00-16.00 : Defect passivation and gettering (Gudrun Kissinger)

16.00-17.30 : Poster presentation (II)

Friday 10 July: Morning-Defect modeling

09.00-10.30 : An introduction to first-principles simulations（Shuhuai Wei）

10.30-11.00 : Break

11.00-12.30: Modeling of defects in different phases of matters: from three-dimensional crystalline/amorphous materials to two-dimensional ones (Shuhuai Wei)

12.30-14.00 : Lunch

Afternoon: Lab tour and excursion

14.00-15.30 : Visit State Key Laboratory of Silicon Materials at Zhejiang University

15.30-17.30 : Excursion to Lingyin temple

18.30-20.00 : Conference dinner