

CURRICULUM VITAE

Date: 27 March 2018

Name: **Yordan Marchev Georgiev**

CURRENT POSITIONS AND ADDRESSES

Head of Nanofabrication

Institute of Ion Beam Physics and Materials Research
Helmholtz-Zentrum Dresden-Rossendorf (HZDR)
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Associate Professor

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PERSONAL DETAILS

Gender: Male

Date of Birth: 16th April 1961

Place of Birth: Dimitrovgrad, Bulgaria

Nationality: Bulgarian

Marital Status: married; one daughter born in March 1992

Foreign Languages: English – fluent, German – proficient, Russian – fluent, Polish – working

EDUCATION AND ACADEMIC QUALIFICATIONS

Degree:	MSc in Electronic Engineering
Place and Date:	Saint Petersburg State Electrotechnical University, Saint Petersburg, Russia (www.eltech.ru), February 1987
Thesis Title:	First Class Honours thesis entitled "Study of the Influence of Bulk and Surface Magnetic Anisotropy on Spin-Wave Resonance in Yttrium Iron Garnet Thin Films".
Supervisor:	Prof. D.Sci. Boris A. Kalinikos

Degree: **Ph.D. in Physics**
Place and Date: Bulgarian Academy of Sciences, Sofia, Bulgaria, June 1997
PhD Thesis Title: “Numerical modelling of penetration of accelerated electrons in solids and some particular applications”.
Supervisor: Prof. D.Sci. Georgi M. Mladenov

EMPLOYMENT

03.1985 – 02.1987 **Research Assistant**, Spin-Waves Group, Department of Electron, Ion and Vacuum Technologies, Saint Petersburg State Electrotechnical University "LETI", Saint Petersburg, Russia

10.1987 – 09.1988 **Post-graduate courses in Applied Mathematics and Computer Science**, Technical University, Sofia, Bulgaria (www.tu-sofia.bg)

10.1988 – 01.1992 **Physicist**, Research Laboratory of Physical Problems of Electron Beam Technologies (RL PPEBT), Institute of Electronics (IE), Bulgarian Academy of Sciences (BAS), Sofia, Bulgaria (<http://www.ie-bas.org>)

02.1992 – 04.1996 **Ph.D. student in Applied Physics**, Institute of Electronics, BAS

04.1996 – 12.1997 **Research Associate Second Grade**, Institute of Electronics, BAS

12.1997 – 11.2008 **Research Associate First Grade**, Institute of Electronics, BAS

11.2008 – Present **Associate Professor in Applied Physics**, Institute of Electronics, BAS

09.1998 – 06.2000 Four visits, 3-4 months each, as a **Guest Scientist** in the New Materials Department, Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany (www.hzdr.de)

09.2000 – 11.2003 **Senior Researcher**, Advanced Microelectronic Center Aachen (AMICA), AMO GmbH, Aachen, Germany (www.amo.de) (leave of absence from IE-BAS)

11.2003 – 10.2005 **Head of Electron Beam Lithography Group** Advanced Microelectronic Center Aachen (AMICA), AMO GmbH, Aachen, Germany (www.amo.de) (leave of absence from IE-BAS)

02.2011 – 09.2015 **Devices and Fabrication Activity Leader**, Materials Chemistry & Analysis Group, Micro & Nano Systems Centre, Tyndall National Institute, University College Cork, Cork, Ireland (www.tyndall.ie) (leave of absence from IE-BAS)

09.2015 – Present **Head of Nanofabrication**, Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany (www.hzdr.de) (leave of absence from IE-BAS)

RESEARCH ACTIVITIES

- 1985 – 1987 Spin waves in thin ferromagnetic films.
- 1988 – 1989 Design of a thermal-field emission electron gun for electron microscopy and electron beam lithography (EBL).
- 1989 – 1998 Electron beam technologies and technique, experimental EBL, superconductivity, high temperature superconductors (HTS), patterning of thin HTS films by EBL and wet chemical etching, HTS electron devices and their fabrication, physical processes during interaction of charged particles with materials, Monte Carlo simulation of penetration and scattering of accelerated electrons in solids, numerical modelling and computer simulation of the EBL processes (exposure and development of the resist), bootstrap method in statistics.
- 1998 – 2000 Defect engineering and impurity gettering in silicon (Si) by high energy (MeV) ion implantation, trans projected range (trans- R_p) effect, spreading resistance profiling (SRP) technique for depth distribution measurement of dopants in Si substrates, diffusion of dopants and intrinsic point defects in silicon.
- 2000 – 2011 Nanotechnology; micro- and nanofabrication of various structures and devices for semiconductor electronics, optoelectronics, nanoimprint lithography, bionanotechnology, etc.; EBL and scanning electron microscopy (SEM) in the 10 nm region; fabrication of sub-50 nm metal T- and Γ -gates for SiGe/Si Hetero-FETs; fabrication of nanostructures with high (> 10) aspect ratio (AR); characterisation and application of hydrogen silsesquioxane (HSQ) as a high resolution negative tone electron beam resist; characterisation of resist roughness; Megasonic agitation ($f = 1$ MHz) of development process of lithographic nanostructures; study of the collapse mechanism of high-AR lithographic nanostructures as well as of the impact of supercritical CO₂ drying process on their parameters.
- 2011 – Present Design, fabrication and characterisation of planar and vertical nanowire devices in Si, Silicon on Insulator (SOI), Ge, Germanium on Insulator (GeOI) and Germanium-Tin alloys (GeSn) for applications as sensors, field effect transistors (FETs), photovoltaic (PV) cells and quantum computing devices. Advanced techniques for non-destructive and ultrahigh doping of semiconductors and semiconductor nanostructures. Density multiplication of lithographic patterns using directed self-assembly (DSA) of block-co-polymers (BCP). Contacting and electrical characterisation of randomly distributed nanostructures (nanowires, DNA origami, 2D materials).

PARTICIPATION IN RESEARCH PROJECTS

Participated in more than 40 national, international, and industry related research Projects. Head in five of them.

TEACHING ACTIVITIES

Supervisor and consultant of PhD and MSc students in the Faculty of Electronic Engineering and Technology, Technical University of Sofia, Bulgaria; Electrotechnical Faculty, RWTH Aachen University of Technology, Germany; Faculty of Chemistry, University College Cork, Ireland; and Technical University Dresden, Germany.

Invited lectures at the South-West University in Blagoevgrad, Bulgaria.

Theoretical training of nanofabrication users at Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany.

PROFESSIONAL ACTIVITIES

Member of the Organising Committee of three International Conferences and two Workshops.

Member of the Scientific Council of the Institute of Electronics, Bulgarian Academy of Sciences, April 2009 - 2014.

Member of the Attestation Commission of the Institute of Electronics, Bulgarian Academy of Sciences, May 2009 - 2014.

Peer reviewer for a number of journals including *Thin Solid Films*, *Microelectronic Engineering*, *IEEE Electron Device Letters*, *IEEE Journal of the Electron Devices Society*, *Journal of Material Chemistry C*, *Journal of Micro/Nanolithography*, *MEMS*, *MOEMS*, *Journal of Engineering and Technology Research*, *Beilstein Journal of Nanotechnology*, etc.

AWARDS AND SCHOLARSHIPS

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| 1979 | Silver Medal of the Bulgarian Ministry of Education for excellent study results and active service to the community. |
| 1980 | Honorary Diploma and named watch from the Bulgarian Ministry of Defence for best study results in the School for Reserve Officers, Shumen, Bulgaria. |
| 1981-87 | Scholarship for study abroad from the Bulgarian government. |
| 1986 | Honorary Diploma from the city of Saint Petersburg, Russia, for excellent study results and outstanding contribution to the mutual understanding and friendship between the peoples of Bulgaria and Russia. |
| 1987 | First Grade Honorary Diploma from the Saint Petersburg State Electrotechnical University, Saint Petersburg, Russia for excellent study results. |
| 1987 | Golden Medal of the Bulgarian Ministry of Education for excellent study results and active service to the community. |
| 1987 | Entered into the Book of Honour of the Bulgarian Consulate General in Saint Petersburg, Russia. |

- 1993-96 Research Grant from the Bulgarian National Science Fund.
- 1999 Grant for foreign Guest Scientists from the Research Centre Rossendorf, Germany.
- 1999-2000 Research Grant for foreign Guest Scientists from the Saxonian State ministry of Science and Art, State of Saxony, Germany.

PUBLICATIONS

Six invited book chapters, around 80 journal articles and full text conference papers (see the separate List of Publications), 45 of them cited more than 400 times. Hirsch index (h-index) of 12. For a list of publications please visit:

https://www.researchgate.net/profile/Yordan_Georgiev

or

<https://scholar.google.bg/citations?user=GeprsdMAAAAJ&hl=bg&oi=ao>

LIST OF REFERENCES

Prof. Dr. Justin D. Holmes

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Department of Chemistry, University College Cork, Cork, Ireland.

Tyndall National Institute, Lee Maltings, Cork, Ireland.

CRANN & AMBER, Trinity College Dublin, Dublin 2, Ireland.

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