Curriculum Vitae

Ion Tiginyanu

Date of Birth: 22 March 1955
Place of Birth: Sofia, Drochia, Republic of Moldova
Address: 1 Stefan cel Mare av., Chisinau 2001, Moldova
Current position: President of the Academy of Sciences of Moldova, scientific manager of the National Center for Materials Study and Testing, Technical University of Moldova;

E-mail: tiginyanu@asm.md; ion.tighineanu@cnstm.utm.md, tiginyanu@gmail.com
Phone: +373 22 27 14 78
Fax: +373 22 54 28 23

Education

1982 - Ph.D. in Physics, Lebedev Institute of Physics, USSR Academy of Sciences, Moscow, USSR;
1978 - M.S. with Honors in Physics and Engineering, Moscow Institute of Physics and Engineering.

Higher Doctorate/Professorship

1993 - Full Professor (Electronic Engineering), Technical University of Moldova and Supreme Certificate Commission at the Council of Ministers of Moldova;
1991 - Dr. Habilitate in Physics, Institute of Applied Physics, Chisinau, Moldova and Supreme Certificate Commission at the USSR Council of Ministers, Moscow, USSR.

Professional Background

09.04.2019 – present – President of the Academy of Sciences of Moldova
12/2012-04/2019 - First Vice-President of the Academy of Sciences of Moldova;
11/2004-12/2012 - Vice-President of the Academy of Sciences of Moldova;
2001-present - Founder and Director, National Center for Materials Study and Testing, Moldova;
05/1998-11/2004 - Vice-Rector of the Technical University of Moldova, Chisinau, Moldova;
12/2000-05/2001 - Visiting Professor, EECS Department, University of Michigan, USA;
10/1995-12/1996, 11/1998-07/1999 - Visiting Professor, Technical University Darmstadt, Germany;
1984-1998 - Senior and Leading Research Scientist, Head of the Laboratory, Institute of Applied Physics, Academy of Sciences of Moldova, Chisinau, Moldova.

Professional Recognition and Memberships

Award "Champion of Change - 2019", Laboratory of Initiatives for Development, Republic of Moldova;
Fellow of the International Society for Optics and Photonics (SPIE), 2018;
Senior Member of the Optical Society of America (OSA), 2018;

Honorary Professor of the Shizuoka University, Japan, 2017
'Inventor of the Year' Award from the TeleRadio-Moldova Company, 2016;
Honorary Member of the Romanian Academy, 2015;
Honorary Doctor of the Joint Institute for Nuclear Research, Dubna, Russian Federation, 2015;
Award of the Academies of Sciences of Belarus, Moldova and Ukraine for scientific achievements, 2014;
Doctor Honoris Causa of the State University of Balti, Republic of Moldova, 2014;
Honorary Member of the Academy of Romanian Scientists (AOSR), 2013;
Full Member (Academician) of the Academy of Sciences of Moldova, since 2012;
'Outstanding Inventor' Award from the World Intellectual Property Organization (WIPO), 2011;
'Scientist of the Year' Award and Honoured Person of the Republic of Moldova, 2005;
National Prize in Science and Technology, Republic of Moldova, 2004;
Alexander von Humboldt Fellowship, Bonn, Germany, 1995;
Research Award of the Academy of Sciences of Moldova, 1992;
Member of the American Association for the Advancement of Science (AAAS, since 2004);
Member of the Materials Research Society (MRS, since 1996);
Member of the Electrochemical Society (since 2000);
Member of the Optical Society of America (OSA, since 2007);
Member of IEEE (since 2012);
Member of the International Committee on Capacity Building (World Federation of Engineering Associations), Washington D.C. (2004-2017);
Member of the International Board of the "Ukrainian Journal of Physics", since 2009-2017.

Research Areas/Interests

Nanotechnologies and nanomaterials (nanotubes, nanowires, nanodots); Materials science (III-V and II-VI compounds, nanostructured thin membranes, semiconductor-metal ordered networks, metamaterials, photonic crystals, negative refractive index materials, nanomaterials for random lasers and photovoltaic applications); Micro- and nanostructuring of semiconductors for the development of photonic crystals, waveguides, splitters, focusing elements, sensors etc.; Novel nanocomposite materials (semiconductor/metal and semiconductor/polymer) for photonic and nonlinear optical applications; Ternary and multinary semiconductor compounds, phase transitions under hydrostatic pressure; Electrochemical treatment of electronic materials for sensor applications, templated electrochemical deposition; Luminescence, micro-Raman scattering, electron-phonon interaction, optical and electrical properties of low-dimensional structures, optical absorption, reflection, impedance spectroscopy, surface charge lithography, maskless lithography, scanning electron microscopy, atomic force microscopy, THz spectroscopy.

Teaching, Advisor

Teaching: Nanotechnologies, Solid State Physics, Materials for Micro-Optoelectronics and Photonics;
Scientific adviser: 18 Ph.D. theses and 2 Dr. Habilitate theses.

Publications, Patents, Citations

Publications: about **400 scientific journal publications**, 6 books in English (among them: **three books edited by Springer in Germany, one edited by Woodhead Publishing in UK**), 52 technological patents:
Citations: over 5900 (Scopus);
***Hirsch index*: *h* = 40** (Scopus)

Scientific Reports

Over 120 Scientific Reports and Lectures at many universities and research centers from USA, Canada, Germany, Italy, France, Japan, Republic of Korea, UK, Romania, Spain, Sweden, the Netherlands, Belgium, Greece, Portugal, Denmark, Poland, Hungary, China, Russia, Ukraine etc.

Awards

- ***'Inventor of the Year'* Award** from the TeleRadio-Moldova Company, 2016;
- ***'Outstanding Inventor' Award*** from the World Intellectual Property Organization (WIPO), 2011;
- ***19 Gold and Silver Awards*** at the International Exhibitions "Eureka-2005, 2006, 2011" (Brussels); International Exhibition of Inventions in Geneva (2007, 2008, 2009, 2016); InfoInvent etc.;
- ***Gold Prize*** at the Seoul International Invention Fair 2008 organized by Korea Invention Promotion Association in Seoul, Korea on December 11-15, 2008, for the invention of "*Nanotubes in semiconductor matrix*";
- ***Gold Medal Award (Award of Excellence)*** at the International Exhibition of Inventions and New Products in Pittsburgh (USA, 2005), for the invention of the "*Surface Charge Lithography*".

Organizer of International Conferences

- Co-chairman of the 4rd International Conference on Nanotechnology and Biomedical Engineering, Sept. 18-21, 2019, Chisinau, Republic of Moldova;
- Chairman of the SPIE Nanotechnology Conferences (7th and 8th editions), Barcelona, Spain, May 4-6, 2015 and May 8-9, 2017;
- Co-chairman of the SPIE Nanotechnology Conference (6th edition), Grenoble, France, April 24-26, 2013;
- Co-chairman of the 3rd International Conference on Nanotechnology and Biomedical Engineering, Sept. 23-26, 2015, Chisinau, Republic of Moldova;
- Co-chairman of the 2nd International Conference on Nanotechnology and Biomedical Engineering, April 18-20, 2013, Chisinau, Republic of Moldova;
- Co-chairman of the 1st International Conference on Nanotechnology and Biomedical Engineering, July 7-8, 2011, Chisinau, Republic of Moldova;
- Co-chairman of a series of International Conferences on Microelectronics and Computer Science, Chisinau, Moldova;
- Co-chairman of a series of German-Moldovan Workshops on Novel Nanomaterials for Electronic, Photonic and Biomedical Applications.

Highlights of the scientific results by international portals

- 11 technological developments have been highlighted by the NanoTechWeb.org portal, and one development has been highlighted by the Physics World portal (https://physicsworld.com/a/hydrophobic-or-hydrophilic-aero-gallium-nitride-is-both/);
- 7 technological developments and scientific results have been highlighted on Cover of international journals (e.g. https://onlinelibrary.wiley.com/doi/abs/10.1002/smll.201670203; https://onlinelibrary.wiley.com/doi/abs/10.1002/pssr.201290008; https://onlinelibrary.wiley.com/doi/10.1002/pssr.201090005 etc.).

Participation in the realization of regional and international scientific projects

1. Project NanoMedTwinn no 810652 „Promoting smart specialization at the Technical University of Moldova by developing the field of novel nanomaterials for biomedical applications through excellence in reserarch and twinning" (2018-2021);
2. Project SCOPES-Swiss no IZ73Z0_152273/1 **"**Development and characterization of ultra-thin membranes of GaN and related nitride materials for sensor and piezo/acoustophotonic applications" (2014-2017);
3. Project STCU no 5933 "Development of maskless lithography for three-dimensional nanostructuring of GaN" (2014-2015);
4. Project BMBF-Germany „NanoEngine on titania nanotubes for biological applications" (2013-2015);
5. Project FP7 - Mold-Era no 266515 "Preparation for Moldova's integration into the European Research Area and into the Community R&D Framework Programmes on the basis of scientific excellence" (2010-2013);
6. Project SCOPES-Swiss no Z73Z0 128047 "Nanopatterned materials for the improvement of terahertz quantum cascade lasers and laser-driven solid-state terahertz emitters", (2010-2012);
7. Project STCU no 4034 "Development of random lasers based on porous semiconductor compounds for photonic applications";
8. Project INTAS no 05-104-7567 "Development of THz sources on nanostructured semiconductors and focusing elements on photonic crystals" (2006 – 2008);
9. Project CGP-CDRF no ME2-2527 "Development of optical frequency up-converters and dielectric mirrors based on nanostructured III-V compounds for integrated optoelectronic circuits" (2004 – 2006);
10. Project INTAS no 01- 0796 "Monolayered opalline superlattice: application to nano-technology of 2D ordered array of epitaxial nanodots and metalattice conductors" (2004 – 2005);
11. Project INTAS no 01- 0075 "Ferroelectrics templated in nanoporous membranes" (2004 – 2005);
12. Project BMBF-Germany "Submicrometer GaN Schottky diodes for THz Applications" (2002-2004);
13. Project BGP-CRDF no ME2-3013 "Phonon Engineering in III-V Nitrides for Device Applications" (2002 – 2004);
14. Project DFG-Germany "Nonlinear optical properties of nanostructured III-V compounds" (2000-2002);

15. Project COBASE (NRC-USA) “Three-Dimensional Microstructuring and Nanoheteroepitaxy of Gallium Nitride” (2000-2001);
16. High Technology NATO Grant no. HTECH.LG 961399 “Porosity-induced confinement phenomena in III-V compounds” (1997-2000).

Member of the Advisory Board at international scientific journals

1. Semiconductor Science and Technology, IOP Publishing, United Kingdom (https://iopscience.iop.org/journal/0268-1242/page/Editorial%20Board).
2. European Journal of Engineering Education, Taylor & Francis, United Kingdom (https://www.tandfonline.com/action/journalInformation?show=editorialBoard&journalCode=ceee20).
3. Romanian Reports in Physics, Publishing House of the Romanian Academy (http://www.rrp.infim.ro/editorial.html).
4. Surface Engineering and Applied Electrochemistry, IAP (Springer) (https://www.springer.com/engineering/production+engineering/journal/11987).

Guest Editor of International Scientific Journals

1. Andrei Rotaru, Finlay D. Morrison, Ion Tiginyanu (Guest Editors), ***Ceramics International***, Special issue on „Thermophysical Aspects of Functional Ceramics and Surfaces”, Vol. 45, no 2, part B (February 2019).
2. Yogendra Mishra, Jost Adam, Oliver G. Schmidt, Ion Tiginyanu (Guest Editors), ***Vacuum***, Special Section on “Materials – Nanoelectronics & Nanophotonics”, Vol. 155 (2018).
3. Helmut Föll, Mark-Daniel Gerngross, Michael J Sailor and Ion Tiginyanu **(**Guest Editors**),** ***Semiconductor Science and Technology***, Special issue on „Electrochemical Processing of Semiconductor Materials”, Vol. 31, no. 1 (2016).
4. Hadis Morkoc, Ion Tiginyanu (Guest Editors), ***Turkish Journal of Physics***, Special Issue on „Nano- and Self-Assembled Structures”, Vol. 38, no 3 (2014).
5. Ion Tiginyanu, Rainer Adelung (Guest Editors), ***Journal of Nanoelectronics and Optoelectronics***, A Special Section on „Nanotechnologies and Nanomaterials for Electronic and Photonic Applications”, Vol. 9, no 2, preface on pp. 193-195 (2014).
6. Ion Tiginyanu (Guest Editor), ***Journal of Nanoelectronics and Optoelectronics***, A Special Section on „Nanotechnologies and Nanomaterials for Electronic, Phononic and Photonic Applications”, Vol. 7, no 7, preface on pp. 637-639 (2012).

Editor of Conference Proceedings

1. "Nanotechnology VIII", Ion M. Tiginyanu, Rainer Adelung, Andrei Sarua (Editors). ***Proceedings of SPIE***, Vol. 10248 (SPIE, Bellingham, WA 2017), ISBN: 9781510609976.
2. Nanotechnology VII", Ion M. Tiginyanu (Editor). ***Proceedings of SPIE,*** Vol. 9519, SPIE, 2015. ISBN: 9781628416428.
3. ***IFMBE Proceedings***, Vol. 55 (2015). 3rd International Conference on Nanotechnologies and Biomedical Engineering, ICNBME-2015, September 23-26, 2015, Chisinau, Republic of Moldova (Editors: V. Sontea, I. Tiginyanu), ISBN: 978-981-287-736-9.

Books

1. *Nanostructures and Thin Films for Multifunctional Applications*. Ion Tiginyanu, Pavel Topala and Veaceslav Ursaki (Eds.). Springer, Germany (2016). 576 pages.
2. *Pressure-Induced Phase Transitions in AB_2X_4 Chalcogenide Compounds*. F. J. Manjon, I. Tiginyanu, and V. Ursaki (Eds.). Springer, Germany (2014). 345 pages.
3. *Nanocoatings and Ultra Thin-Films.* A. S. Hamdy and I. Tiginyanu (Eds.). Woodhead Publishing Limited, Abington Cambridge, UK (2011). 448 pages.
4. *Nanoscale Phenomena: Fundamentals and Applications*. Horst Hahn, Anatoli Sidorenko, and Ion Tiginyanu (Eds.). Springer, Berlin/Heidelberg (2009). 230 pages.
5. *II-III_2VI_4 compounds under high pressure*. V. Ursaki, I.M Tiginyanu, and F.J. Manjon. Chişinău, AŞM, Moldova (2010). 168 pages. ISBN 978-9975969079.

Porous III-V Semiconductors. I. Tiginyanu, S. Langa, H. Föll and V. Ursaki. Stiinta, Chisinau (2005). 240 pages (see also online http://www.porous-35.com/).

Professional Experience

I was involved in the development of new luminescent materials (phosphors) at the Lebedev Institute of Physics of the Academy of Sciences of USSR where in 1982 I defended my PhD thesis. Subsequently I joined the Institute of Applied Physics of the Academy of Sciences of Moldova where I contributed to the growth and characterization of wide-band-gap binary and ternary semiconductor compounds for optoelectronic and photonic applications. After 1991 I visited for periods of up to three months Cagliari University (Prof. Alberto Anedda) and Parma University (Prof. Carlo Razzetti) in Italy as well as the National Technical University of Athens (Prof. Evangelos Anastassakis) in Greece where I studied luminescence and phase transitions in thin films and porous samples of binary and ternary semiconductor compounds. In 1995/96 and 1998/99 I visited the Technical University of Darmstadt in Germany as a Humboldt research fellow where I contributed to the development of new porous materials for optoelectronic and

photonic applications. In 2000/2001 I realized a project devoted to GaN nanostructuring at the University of Michigan (Prof. Dimitris Pavlidis) in US under the sponsorship of the National Research Council ("Collaboration in Basic Science and Engineering" Program). In 2003-2005 I realized the project "Development of Optical Frequency Up-Converters and Dielectric Mirrors Based on Nanostructured III-V Compounds for Integrated Optoelectronic Circuits" in collaboration with Prof. Robert Boyd from the University of Rochester in US (Grant # ME2-2527 from the US Civilian Research and Development Foundation). Over the last two decades, I participated in the realization of 16 international projects devoted to optics, optoelectronics and photonics. I presented over *120 scientific reports and lectures* at universities and research centers from USA, Canada, Germany, Italy, France, Japan, Republic of Korea, England, Spain, Sweden, the Netherlands, Belgium, Greece, Portugal, Poland, Hungary, China, Russia etc.