



## Curriculum Vitae

### Ion Tiginyanu (Tighineanu)

**Date of Birth:** 22 March 1955

**Place of Birth:** Sofia, Drochia, Republic of Moldova

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#### 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

Since 12/2012 - 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

Honorary Professor of the Shizuoka University, Japan, 2017

‘Inventor of the Year’ Award from the TeleRadio-Moldova Company, 2016;

„Dumitru Ghițu” Award of the Academy of Sciences of Moldova in Engineering Sciences (2016);

Honorary Member of the Romanian Academy, 2015;

Honorary Doctor of the Joint Institute for Nuclear Research, Dubna, 2015;

Senior member of the International Society for Optics and Photonics (SPIE), 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), since 2013;

Full Member (Academician) of the Academy of Sciences of Moldova, since 2012;

‘Outstanding Inventor’ Award from the World Intellectual Property Organization (WIPO), 2011;

Corresponding Member of the Academy of Sciences of Moldova, since 2007;

‘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. (since 2004);  
 Member of the Editorial Board of the “Semiconductor Science and Technology” (IOP), since 01/2013;  
 Member of the Editorial and Advisory Board of the “Romanian Reports in Physics”, since 10/2013;  
 Member of the Editorial Board of the “Surface Engineering and Applied Electrochemistry”, since 01/2012;  
 Member of the International Board of the “Ukrainian Journal of Physics”, since 2009;  
 Member of the Editorial Board of the “European Journal of Engineering Education”, since 2004.

### Research Areas/Interests

Nanotechnologies, nanomaterials and biocompatible materials, materials science (III-V and II-VI compounds, radiation-hard materials, 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.

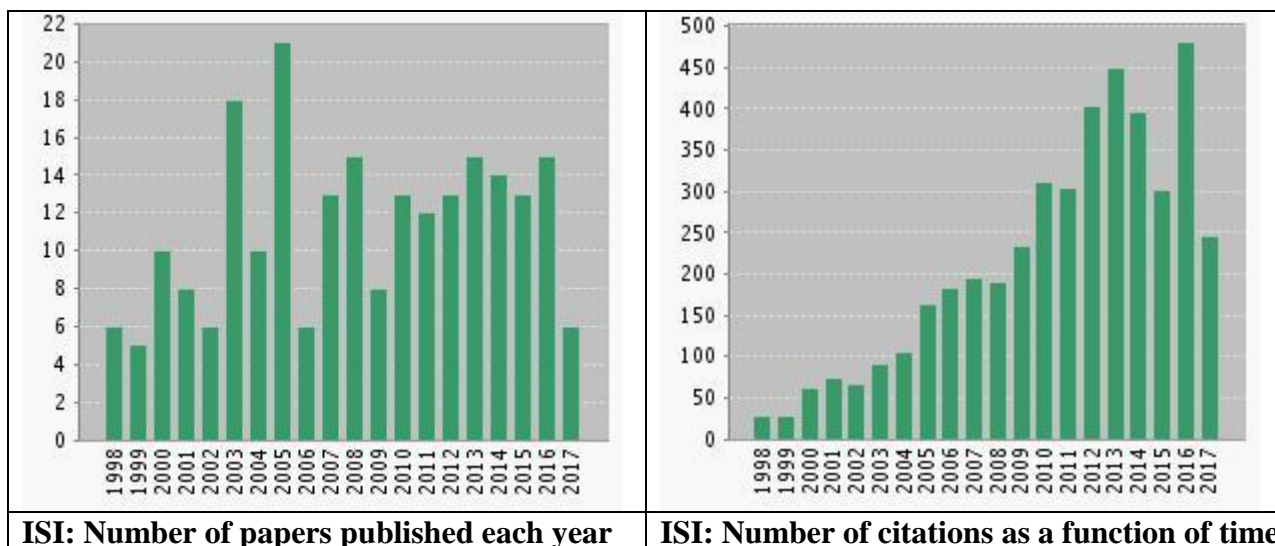
### Teaching, Advisor

*Teaching:* Nanotechnologies, Solid State Physics, Materials for Micro-Optoelectronics and Photonics  
*Scientific adviser:* 16 Ph.D. theses and 2 Dr. Habilitate theses.

### Publications, Patents, Citations

*Publications:* about 320 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.

*Hirsch index:*  $h = 35$  (Institute of Scientific Information);  $h = 35$  (SCOPUS)



## Scientific Reports

*Over 100 Scientific Reports and Lectures* at many universities and research centers from USA, Canada, Germany, Italy, France, Japan, Republic of Korea, England, Spain, Sweden, the Netherlands, Belgium, Greece, Portugal, Denmark, Poland, Hungary, China, Russia, Romania, 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), 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

- Chairman of the SPIE Nanotechnology Conference, Barcelona, Spain, May 4-6, 2015 and May 8-10, 2017;
- Co-chairman of the SPIE Nanotechnology Conference, Grenoble, France, April 24-26, 2013;
- Co-chairman of the 3<sup>rd</sup> International Conference on Nanotechnology and Biomedical Engineering, Sept. 23-26, 2015, Chisinau, Republic of Moldova;
- Co-chairman of the 2<sup>nd</sup> International Conference on Nanotechnology and Biomedical Engineering, April 18-20, 2013, Chisinau, Republic of Moldova;
- Co-chairman of the 1<sup>st</sup> 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 Nanotechnologies (since 2011 - Workshops on Novel Nanomaterials for Electronic, Photonic and Biomedical Applications).

## Highlights of the scientific results by NanoTechweb.org (London)

- Graphene aerogel makes for ultra-lightweight pressure sensors  
<http://nanotechweb.org/cws/article/lab/67197>
- Light drives titania nanotube micro-engines  
<http://nanotechweb.org/cws/article/tech/66446>
- Electrochemical etching improves gallium nitride  
<http://nanotechweb.org/cws/article/tech/64156>
- Aerographite makes multifunctional hybrid  
<http://nanotechweb.org/cws/article/tech/61134>
- “Hopping” electrodeposition makes gold nanodot plating  
<http://nanotechweb.org/cws/article/tech/60254>
- Surface writing produces optical waveguides  
<http://nanotechweb.org/cws/article/tech/55933>
- Surface writing produces designer nanostructures  
<http://nanotechweb.org/cws/article/tech/49261>
- Nano-roof reveals dislocations  
<http://nanotechweb.org/cws/article/tech/44967>
- Salty water puts metal nanotubes in order  
<http://nanotechweb.org/cws/article/tech/34704>

- Temperature orders TiO<sub>2</sub> nanotubes  
<http://nanotechweb.org/cws/article/tech/42313>
- Gallium nitride nanopyramids resist radiation  
<http://nanotechweb.org/cws/article/tech/30017>

**Participation in the realization of scientific projects (in most cases as director or national coordinator):**

1. Project SCOPES-Swiss no IZ73Z0\_152273/1 „Development and characterization of ultrathin membranes of GaN and related nitride materials for sensor and piezo/acoustophonic applications” (2015-2017);
2. Project STCU no 5933 “Development of maskless lithography for three-dimensional nanostructuring of GaN” (2014-2015);
3. Project BMBF-Germany „NanoEngine on titania nanotubes for biological applications” (2013-2015);
4. 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);
5. 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);
6. Project STCU no 4034 “Development of random lasers based on porous semiconductor compounds for photonic applications”;
7. Project INTAS no 05-104-7567 “Development of THz sources on nanostructured semiconductors and focusing elements on photonic crystals” (2006 – 2008);
8. 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);
9. Project INTAS no 01- 0796 “Monolayered opalline superlattice: application to nano-technology of 2D ordered array of epitaxial nanodots and metalattice conductors” (2004 – 2005);
10. Project INTAS no 01- 0075 “Ferroelectrics templated in nanoporous membranes” (2004 – 2005);
11. Project BMBF-Germany “Submicrometer GaN Schottky diodes for THz Applications” (2002-2004);
12. Project BGP-CRDF no ME2-3013 “Phonon Engineering in III-V Nitrides for Device Applications” (2002 – 2004);
13. Project DFG-Germany “Nonlinear optical properties of nanostructured III-V compounds” (2000-2002);
14. Project COBASE (NRC-USA) “Three-Dimensional Microstructuring and Nanoheteroepitaxy of Gallium Nitride” (2000-2001);
15. High Technology NATO Grant no. HTECH.LG 961399 “Porosity-induced confinement phenomena in III-V compounds” (1997-2000).

**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<sub>2</sub>X<sub>4</sub> 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<sub>2</sub>VI<sub>4</sub> compounds under high pressure*. V. Ursaki, I.M Tiginyanu, and F.J. Manjon. Chişinău, AŞM, Moldova (2010). 168 pages. ISBN 978-9975969079.
6. *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/>).

### **Guest Editor of International Scientific Journals**

1. 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).
2. Hadis Morkoc, Ion Tiginyanu (Guest Editors), *Turkish Journal of Physics*, Special Issue on „Nano- and Self-Assembled Structures”, Vol. 38, no 3 (2014).
3. 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).
4. 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. Proceedings of SPIE “Nanotechnology VII”, Vol. 9519, Ion M. Tiginyanu (Editor). SPIE, 2015. ISBN: 9781628416428.
2. IFMBE Proceedings, Vol. 55 (2015). 3rd International Conference on Nanotechnologies and Biomedical Engineering, ICNBME-2015, September 23-26, 2015, Chisinau, Republic of Moldova (Eds.: V. Sontea, I. Tiginyanu), ISBN: 978-981-287-736-9.

### **Book Chapters**

1. Template assisted formation of metal nanotubes.  
Ion Tiginyanu, Veaceslav Ursaki, and Eduard Monaico.  
In: Ion Tiginyanu, Pavel Topala and Veaceslav Ursaki (Eds.), *Nanostructures and Thin Films for Multifunctional Applications*. Springer, Germany, 2016. Chapter 15, pp. 473-506 (2016).
2. Relation of II-III<sub>2</sub>VI<sub>4</sub> compounds to other materials, their properties and applications.  
V. V. Ursaki and I. M. Tiginyanu.  
In: F. J. Manjon, I. Tiginyanu, and V. Ursaki (Eds.), *Pressure-Induced Phase Transitions in AB<sub>2</sub>X<sub>4</sub> Chalcogenide Compounds*. Springer, Germany, 2014. Chapter 1, pp. 1-50 (2014).
3. II-III<sub>2</sub>VI<sub>4</sub> compounds with other types of structures at high pressures.  
V. V. Ursaki and I. M. Tiginyanu.  
In: F. J. Manjon, I. Tiginyanu, and V. Ursaki (Eds.), *Pressure-Induced Phase Transitions in AB<sub>2</sub>X<sub>4</sub> Chalcogenide Compounds*. Springer, Germany, 2014. Chapter 8, pp. 213-235 (2014).
4. Nanostructures of Metal Oxides.  
I.M. Tiginyanu, O. Lupan, V. V. Ursaki, L. Chow, and M. Enachi.  
In: P. Bhattacharya, R. Fornari, H. Kamimura (Eds.), *Comprehensive Semiconductor Science and Technology*, Vol. 3, pp. 396-479. Elsevier Science, Amsterdam, 2011.
5. Nanoimprint lithographic techniques for electronics applications.  
I.M. Tiginyanu, V. V. Ursaki and V. Popa.  
In: A. S. Hamdy Makhoulouf and I. Tiginyanu (Eds.), *Nanocoatings and Ultra Thin-Films*. Woodhead Publishing Limited, Abington Cambridge, UK, 2011. Chapter 10, pp. 280-329 (2011).
6. Ultra-thin membranes for sensor applications.

- I.M. Tiginyanu, V. V. Ursaki, and V. Popa.  
In: A. S. Hamdy and I. Tiginyanu (Eds.), *Nanocoatings and Ultra Thin-Films*. Woodhead Publishing Limited, Abington Cambridge, UK, 2011. Chapter 10, pp. 330-354 (2011).
7. High performance nanostructured semiconductor and metallo-dielectric layers for space applications.  
I.M. Tiginyanu, V.V. Ursaki, and E.V. Rusu.  
In: Abdel Salam Hamdy Makhlouf (Editor), *High Performance Coatings for Automotive and Aerospace Industries*, pp. 141-227. Nova Science Publishers, New York, 2010.
8. Impedance spectroscopy as a powerful tool for better understanding and controlling the pore growth mechanism in semiconductors.  
A. Cojocaru, E. Foca, J. Carstensen, M. Leisner, I.M. Tiginyanu and H. Föll  
In: *Nanoscale Phenomena: Fundamentals and Applications* (Editors: Horst Hahn, Anatoli Sidorenko, and Ion Tiginyanu), pp. 139-144. Springer, Berlin/Heidelberg, 2009.
9. The way to uniformity in porous III-V compounds via self-organisation and lithography patterning.  
S. Langa, I. Tiginyanu, J. Carstensen, M. Christophersen and H. Föll.  
In: „Ordered Porous Nanostructures and Applications“ (Editor: R. Wehrspohn), pp. 57-87. Springer, New York, 2005.