

## **Curriculum Vitae**

### **Dr. Valentin Craciun**

#### **Present Position**

Senior Research Scientist 1<sup>st</sup> degree  
Group Leader, Advanced Technologies in Thin Films  
National Institute for Laser, Plasma and Radiation Physics  
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and

Senior Research Scientist 1<sup>st</sup> degree  
Extreme Light Infrastructure for Nuclear Physics (ELI-NP)  
Horia Hulubei National Institute for Physics and Nuclear Engineering  
Magurele, Ilfov, Romania

#### **Education**

1988-1991 PhD in Technical Physics, Polytechnic University Bucharest; title of PhD Thesis:  
“Surface studies with laser for microelectronics applications”  
1979-1984 Diplomat Physicist Engineer, Faculty of Technological Physics, University of  
Bucharest; title of Diploma Thesis: “Laser Annealing of Semiconductors”

#### **Employment/Professional Experience:**

2015-2018, scientific consultant, DENTIX Millenium, a Romanian start-up for dental implants  
(<http://dentixmillennium.ro/>)  
June 2014-June 2018, President of the Scientific Council, NILPRP  
August 2014-September 2015, Head of the Laser Department  
April 2009-present: Senior Research Scientist 1<sup>st</sup> degree, Laser Department, National Institute for  
Laser, Plasma and Radiation Physics, Bucharest-Magurele, Romania  
August 2006-August 2012: Associate Research Scientist, Major Analytical Instrumentation  
Center (MAIC), Materials Science and Engineering (MSE), University of Florida, USA  
2003-2006: Assistant Research Scientist, MAIC and graduate faculty MSE, UF  
2000-2009: Senior Research Scientist 2<sup>nd</sup> degree, Laser Department, National Institute for Laser,  
Plasma and Radiation Physics, Bucharest-Magurele, Romania  
September 1998-2003: Visiting scientist, MSE, University of Florida, USA  
April 1998-August 1998: Research fellow, Electronic and Electrical Engineering Department,  
University College London, United Kingdom  
1996-2000: Research Scientist 3<sup>rd</sup> degree, Laser Department, National Institute for Laser,  
Plasma and Radiation Physics, Bucharest-Magurele, Romania  
July 1996-December 1996: Research fellow, Electronic and Electrical Engineering Department,  
University College London, United Kingdom  
September 1994-September 1995: visiting scientist, Laboratoire GREMI, Universite d'Orleans,  
France  
October 1991-September 1994: Research fellow, Electronic and Electrical Engineering  
Department, University College London, United Kingdom

1988-1996: Research Scientist, Laser Department, National Institute for Laser, Plasma and Radiation Physics, Bucharest-Magurele, Romania  
1984-1988: Physicist Engineer, Laser Department, National Institute for Laser, Plasma and Radiation Physics, Bucharest-Magurele, Romania

### **Research Topics:**

- laser-matter interactions
- transparent and conductive oxides for solar cells, displays and transparent electronics
- hard and protective coatings
- high k dielectrics
- bioactive coatings
- high emissivity optical coatings for outer space applications
- coatings for nuclear applications/radiation effects in materials
- nanoparticles synthesis by laser techniques and applications
- structural characterization of thin films and electronic materials
- radiation induced effects in transparent electronics (amorphous oxides)
- radiation induced effects in carbide and nitride thin films
- calibration-free laser-induced breakdown spectroscopy compositional analysis of thin films

### **Awards**

Window on Science award, AFRL Dayton OH, 2017 and 2018  
E-MRS Society Appreciation Diploma, Warsaw, 2015, 2017, 2018, 2019 and Lille, 2015  
The Japan Society for the Promotion of Science Fellowship, 2014  
30 Years Anniversary Medal, E-MRS, Strasbourg, 2013  
Davis Productivity Award, 2009, University of Florida  
A. P. Sloan Certificate of Appreciation, 2007, University of Florida  
Diploma for serving the society, European-Materials Research Society in 2002, 2005, 2008, 2009, 2010, 2013, 2014.  
Diploma for outstanding service, Materials Research Society, USA, 2006 and 2008  
Fellowship of CNRS at University of Paris VII, France, December 2000.  
Fellowship of EPSRC, University College London, UK, 1997  
Fellowship of the French Ministry of Higher Education at University of Orleans, Laboratoire GREMI, France, 1994  
Fellowship of EPSRC, University College London, UK, 1993  
European Community Mobility Fellowship at University College London, Electrical and Electronic Engineering, UK, 1992

### **International Activities**

Member SPIE, MRS

Member of the European-Materials Research Society:

- Board of Delegates, from 2003

- Executive Committee, from 2009

- Vice-president of E-MRS, 2018

- E-MRS: Program Chair, Fall 2012, Spring 2015, Fall 2018

### **Publications summary**

227 papers published in refereed international journals  
80 papers published in proceedings of international conferences  
34 invited presentations at international conferences  
5 patents

## **Publications impact**

More than 3000 citations, H-index=31 (WoK)

## **Conference organization**

1. Symposium D, "*Physics and Chemistry of Advanced Laser Materials Processing*"  
E-MRS Spring Meeting, June 18-21, 2002, Strasbourg, France
2. NATO Advanced Study Institute on *Laser processing of biological tissues and biocompatible materials*, 23 September – 03 October 2003, Limenas Hersonissos (Crete), Greece
3. Symposium J "*Advances in Laser and Lamp Processing of Functional Materials*"  
E-MRS Spring Meeting, May 31 - June 3, 2005, Strasbourg, France
4. Symposium K, "*Current and Future Trends of Functional Oxide Films*", MRS Spring Meeting, April 17-21, 2006, San Francisco
5. Symposium J, "*Synthesis Processing and Characterization of Nanoscale Functional Oxide Films*" - EMRS 2006, Nice, France, 29 May-02 June 2006
6. Symposium I, "*Synthesis and Metrology of Nanoscale Oxides and Thin Films*", MRS Spring Meeting, March 25 - 28, 2008, San Francisco
7. Symposium H, *Synthesis, Processing and Characterization of Nanoscale Multi Functional Oxide Films II*, E-MRS Spring meeting, June 8-12, 2009, Strasbourg
8. Symposium D, *Synthesis, Processing and Characterization of Nanoscale Multi Functional Oxide Films III*, E-MRS Spring meeting, May 9-13, 2011, Nice
9. Symposium A, *Stress, structure, and stoichiometry effects on the properties of nanomaterials*, E-MRS Fall meeting, September 19 - 23, 2011, Warsaw
10. Conference Chair, E-MRS Fall Meeting, Warsaw, September 19 – 23, 2012
11. Symposium B, *Stress, structure, and stoichiometry effects on the properties of nanomaterials II*, E-MRS Fall meeting, September 16-20, 2013, Warsaw
12. Symposium K: Nanostructures, Thin Films and Bulk Oxides-Synthesis, Characterization and Applications, MRS Spring Meeting, San Francisco, April 21-25, 2014
13. Materials, processing, and characterization techniques for future nuclear technologies symposium, E-MRS Fall meeting, Warsaw, September 16-19, 2014.
14. Conference Chair, International Conference on Physics and Advanced Materials, ICPAM-10, Iasi, September 22-26, 2014
15. Conference Chair, E-MRS Spring meeting, 2015, Lille, France.
16. Symposium L, Towards Oxide-Based Electronics: growth and applications of oxide thin films and heterostructures, E-MRS Fall meeting, Warsaw, September 13-18, 2015
17. Conference Chair, International Conference on Physics and Advanced Materials, ICPAM-11, Cluj-Napoca, September 8-14, 2016
18. Symposium T, Materials for current and future nuclear applications: processing, characterization, performance, E-MRS Fall Meeting, Warsaw, 19-22 September, 2016.
19. *Stress, structure, and stoichiometry effects on the properties of nanomaterials IV*, E-MRS Fall meeting, September, 2017, Warsaw
20. ESTAC12 12th European Symposium on Thermal Analysis and Calorimetry, Brasov, Romania, 27-30 August 2018, Conference Chair
21. E-MRS Fall Meeting, Warsaw 16-20 September 2018, General Chair
22. International Conference on Physics and Advanced Materials ICPAM 12, Crete, 22-29 September 2018, Conference Chair
23. Symposium N: *Synthesis, Processing and Characterization of Nanoscale Multi Functional Oxide Films VI*, E-MRS Spring meeting, May 28-31, 2019, Nice
24. Symposium K, Nuclear Materials under Extreme Conditions, E-MRS Fall Meeting, Warsaw 16-20 September 2019.

## Books, Edited

1. *Physics and Chemistry of Advanced Laser Materials Processing*  
Edited by Michel Meunier, **Valentin Craciun**, Eric Fogarassy, Wolfgang Kautek  
Applied Surface Science, Elsevier Science B.V., Volumes 208-209, Pages 1-687 (15 March 2003), Proceedings of the E-MRS 2002 Spring Meeting Symposium D
2. *Advances in Laser and Lamp Processing of Functional Materials*  
Edited by J. Reif, I Zergioti, **V. Craciun**, T. Lippert, J. Perriere,  
Applied Surface Science, Elsevier Science B.V., Volumes 252, Issue 13, 2006: Proceedings of the E-MRS 2005 Spring Meeting Symposium J
3. *Synthesis Processing and Characterization of Nanoscale Functional Oxide Films*, Edited by M. Alexe, **V. Craciun**, R. Gaboriaud, D. Kumar and K. Ebihara, Proceedings of Symposium J, E-MRS Nice, France, 29 May-02 June 2006, Thin Solid Films, Volume 515, Issue 16, Pages 6289-6618, 2007
4. *Current and Future Trends of Functional Oxide Films*, edited by D. Kumar, **V. Craciun**, M. Alexe, K.K. Singh (Mater. Res. Soc. Symp. Proc. **928E**, Warrendale, PA, 2006)
5. *Synthesis, Processing and Characterization of Nanoscale Multi Functional Oxide Films II*, edited by **Valentin Craciun**, Maryline Guilloux-Viry, Marin Alexe, José L. Costa Krämer, Jean-Paul Mosnier, Thin Solid Films vol. 518 (2010) and European MRS Symposia Proceedings vol. 244.
6. *Synthesis, Processing and Characterization of Nanoscale Multi Functional Oxide Films III*, Craciun, Valentin; Guilloux-Viry, Maryline; Alexe, Marin; et al., Thin Solid Films Volume 520 Issue: 14, 2012.
7. *Stress, structure and stoichiometry effects on nanomaterials*, edited by Craciun, Valentin; Gaboriaud, Rolly; Sanchez, Florencio; Schroeder, Thomas, Applied Surface Science Volume 260, 2012.
8. *Stress, structure and stoichiometry effects on nanomaterials II*, edited by Craciun, Valentin; Florencio Sánchez, Fabien Paumier, Dhananjay Kumar, Applied Surface Science 306, 1 July, 2014.
9. V. Craciun, D. Kumar, editors MRS Proceedings vol. 1675, 2014
10. Materials Today: Proceedings, Volume 2, Issue 6, 2015, Page 3789  
Felicia Iacomi, Valentin Craciun, Sebastian Popescu, Kathrin Mueller, Marco Lattuada Editors
11. Applied Surface Science, Volume 352, 15 October 2015, Page 1  
V. Craciun, F. Iacomi, C. Dubourdieu, F. Sánchez Barrera, M. Kompitsas Editors.
12. Applied Surface Science, Volume 381, 15 September 2016, E-MRS Fall Meeting 2015, Symposium L: Towards Oxide-Based Electronics: growth and applications of oxide thin films and heterostructures, Editors Valentin Craciun, Florencio Sánchez.
13. APPLIED SURFACE SCIENCE Volume: 424 Special Issue, Part: 3 Published: DEC 1 2017, Proceedings of ICPAM, **Craciun, Valentin**; Iacomi, Felicia; Tetea, Romulus
14. THIN SOLID FILMS Volume: 651 Pages: 151-151 Published: APR 1 2018, Proceedings of ICPAM 12 Intl. Conf., Edited by Iacomi, Felicia; Tetea, Romulus; **Craciun, Valentin**
15. APPLIED SURFACE SCIENCE Volume: 445 Published: JUL 1 2018, 2017 EMRS-Fall-symposium W: Stress, structure and stoichiometry effects on the properties of nanomaterials IV, Edited by Sanchez, Florencio; Craciun, Valentin

## Books, Contributor of Chapter(s)

1. ZnO and ZnO-Related Compounds, J. Perriere, E. Millon, **V. Craciun**, Chapter 12 in Pulsed Laser Deposition of Thin Films, Edited by Robert Eason, Wiley, Hoboken, 2006.

## Theses and dissertations completed under my supervision at UF, Gainesville, USA

1. Jinwoo Kwak (co-chair), Preparation of multilayered structural composites for enhancing gas barrier property of isotactic polypropylene, August 2010.
2. Junghun Jang, Observation of Defects Evolution in Electronic Materials, May 2009
3. Carmen V. Gaines, Near-surface structural changes in human tooth enamel subject to demineralization and remineralization, April 29, 2008
4. Juhyun Woo, Growth and characterization of ZrC thin films, December 2005

PhD Committee member for more than 40 students at UF  
Students from other institutions:

1. Christophe Dutouquet, External Member (Rapporteur), PhD Committee, Université d'Orleans, Orleans, France, 2001
2. Valentin Dan Nelea, External Member (Rapporteur), PhD Committee, Université Louis Pasteur, Strasbourg, France, June 2002
3. Sebastien Bruneau, External Member (Rapporteur), PhD Committee, Université de la méditerranée, Marseille, France, June 2005
4. Ionela Ionescu, President de Jury, Grenoble, France, March 2015
5. University of Barcelona, member of the PhD Jury, Emerson Coy, February 1<sup>st</sup>, 2016

### **Invited Presentations**

35. Investigations of radiation induced effects in nanostructured ceramic thin films, 4<sup>th</sup> IC4N, Corfu 2019
34. Gamma induced radiation effects on amorphous transparent and conducting oxides, 7<sup>th</sup> TCM and 4<sup>th</sup> Bilateral E-MRS-MRS-Japan Symposium, Oct. 2018, Chania, Greece.
33. INDLAS, Alba Iulia, 3-5 September 2018
32. E-MRS Spring Meeting, June 18-22, 2018, Strasbourg, Symposium K.
31. 3rd International Conference New Trends on Sensing- Monitoring- Teliagnosis for Life Sciences, 7-9 Sept 2017, Bucharest, Romania.
30. Conference of the Romanian Microscopy Society, 16 -18 May, 2017, Sinaia, Romania
29. PLD: a versatile technique for structure-composition-properties investigations, BRAMAT 2017, Brasov, 8-12 March 2017
28. Investigations of Radiation Effects in Amorphous Transparent and Conductive Oxides (NT2.12.01); Craciun, V.; MRS Spring Meeting, 28 March – 1 April 2016, Phoenix, Arizona, US
27. Investigations of Radiation Effects in Amorphous and Nanostructured Thin Films (CSE-2); Craciun, V.; IC4N, 26-30 June 2016, Porto Heli, Greece
26. International Year of Light, Bucharest, 2015
25. ROMOPTO 2015, Bucharest, 31 August-3 September
24. Characteristics of amorphous transparent and conductive oxides grown by combinatorial pulsed laser deposition; South Africa Conference on Photonics, Mabula Lodge, April 2015
23. Combinatorial Pulsed Laser Deposition of Amorphous and Transparent Oxides, MRS Spring Meeting, April 2015.
22. On the metrology of amorphous transparent and conductive oxides grown by combinatorial pulsed laser deposition, IUMRS-ICEM Taiwan, June 2014, Symposium F2: p- or n-type oxide films, transparent conductive films and devices: photovoltaic, optoelectronic, plasmonic, gas sensor and microwave devices
21. PLD of hard coatings, INDLAS Bran, Romania, 19-23 May, 2014
20. Combinatorial PLD of oxide films, E-MRS Spring Meeting May, 2013, Strasbourg, France: Symposium O
19. Characteristics of transitional metal carbo-nitrides thin films grown by pulsed laser deposition, IC4N, June 2013, Corfu, Greece

18. Pulsed laser deposition of hard coatings, ROMOPTO, August 31-September 3<sup>rd</sup> 2012, Bucharest, Romania.
17. Structural and Mechanical properties of Pulsed Laser Deposited carbide thin films, International Conference on Materials Science and Engineering BRAMAT'09, February 26-28, 2009, Brasov, Romania
16. Combinatorial Pulsed Laser Deposition of Thin Films, High Power Laser Ablation Conference, 21-24 April 2008, Taos NM (SPIE).
15. Characterization of Thin-Layered Structures by X-Ray Scattering Methods, Florida AVS Meeting, 2007
14. Pulsed laser deposition of ZrC and LaB6 thin films, ICMCTF 06, May 1-4, 2006, San Diego, USA.
13. Epitaxial ZrC and LaB6 thin films grown by pulsed laser deposition, High Power Laser Ablation, SPIE, Taos, NM 2006
12. Deposition of low-work function thin films by PLD, Advanced Laser Technologies, SPIE, Brasov, 2006
11. Epitaxial ZrC and thin films LaB6 thin films grown by pulsed laser deposition, V Craciun, J Woo, G Bourne, D Craciun, and R.K. Singh, 6th International Balkan Workshop on Applied Physics, July 5-7, 2005, Constanta, Romania (SI L18)
10. Photo-formation of interfacial layers during pulsed laser deposition of high-k dielectrics on silicon, E-MRS Spring Meeting 2003, June 10-13, Strasbourg, Symposium H - Photonic processing of surfaces, thin films and devices
9. Ultra-violet assisted pulsed laser deposition of thin films, NATO Advanced Study Institute on *Laser processing of biological tissues and biocompatible materials*, 23 September – 03 October 2003, Limenas Hersonissos (Crete), Greece
8. Oxygen trapping and interfacial layer formation during pulsed laser deposition of oxide films on silicon, ICMAT-IUMRS-ICA 2003 Meeting, Symposium M: Photo-processing of surfaces, thin films and devices, 7-12 December 2003, Singapore
7. Pulsed laser deposition of Y<sub>2</sub>O<sub>3</sub> on Si: characteristics of the interfacial layer, ALT'01 International Conference on Advanced Laser Technologies, September 10-14, 2001, Constanta, Romania
6. Ultraviolet-assisted pulsed laser deposition of thin oxide films, NATO ARW on Atomistic Aspects of Epitaxial Growth, 25-30 June, 2001, Corfu, Greece
5. Ultraviolet-assisted pulsed laser deposition: a new technique for the growth of thin oxide films at medium and low temperatures, ROMOPTO 2000: Sixth Conference on Optics, 4-7 September, Bucharest, Romania
4. Characteristics of ultraviolet-assisted pulsed laser deposited thin oxide films, MRS Spring Meeting, 24-28 April 2000, San Francisco
3. Challenges in the oxidation of strained SiGe layers, NATO ASI "Fundamental Aspects of Ultrathin Dielectrics on Si-based Devices: Towards an Atomic-Scale Understanding" St. Petersburg, 3-8 August 1997, E. Garfunkel et al Eds., pp. 461-475 (Kluwer, 1998).
2. UV-assisted low temperature oxidation of semiconductors, 1<sup>st</sup> International Conference on Rapid Thermal Processing, Scottsdale, Arizona, 1993
1. Synthesis of semiconductor nitrides by laser irradiation, SPIE International Conference on Laser Processing of Thin Films, Chernautzi, 1990 (SPIE)

#### **Invited seminars**

- Air Force Research Lab, Dayton, OH, USA, Feb. 2018
- Qwa-Qwa Campus, University of Free State, RSA, March 2018
- University of Braga, Department of Physics, Nov. 2017
- Air Force Research Lab, Dayton, OH, USA, 1<sup>st</sup> Feb. 2017.

University of Modena, July 2016  
University of Barcelona, February 2nd, 2016  
ICMAB, Barcelona, December 7<sup>th</sup>, 2015  
PSI, Villigen, Switzerland, July 2015  
University of Linkoping, Sweden, March 2015  
Madrid, CSIC, Spain, October 2014  
Turkey, Ozyegin University, July 2014  
NIMS, Japan, July 2014  
Kochi University, Japan, June 2014  
Spring8, Japan, July 2014  
Institute for Materials Science, Budapest, September 2013  
University of Texas, Arlington, April 2013  
Colorado School of Mines, Golden CO, February 2013  
University of Cyprus, Nicosia, November 2012  
University of Florida, Gainesville, FL 2007  
University of Central Florida, Orlando, FL 2006  
North Carolina A&T University, Greensboro, NC 2005  
University of Texas, El Paso, TX 2003  
Rochester Institute of Technology, NY 2003  
Natl Inst Adv Ind Sci & Technol, Nagoya, Japan, 2003  
University College London, London UK, June 2002  
University of Rutgers, NJ, 2002  
University of Orleans, France 2000

#### **Funded Research Contracts and Grants**

1. High Brightness Electron Source Developments  
Office of Naval Research /Subcontract from William and Mary University, CoPI, 2003-2006, 150,000 \$
2. Thin Film Photovoltaics Partnership Program:  
Fundamental materials research and advanced process development for thin film CIS-based photovoltaics, Midwest Research Inst Renew Energy Lab, 2003-2004, \$30,120
3. Combinatorial pulsed laser deposition of transparent and conductive oxides, Romanian Government grant, 2007-2010, PI, \$330,000.
4. Pulsed laser deposition of amorphous transparent and conductive oxides for TFTs applications, Romanian Government grant, 2013-2015, PI, \$475,000.
5. Radiation effects in SiC, Institute of Atomic Physics, Romania IFA-CEA France grant, 2013-2015, \$300,000
6. Romanian-Hungarian collaborative research agreement on hard coatings, 2013-2014, \$4,000
7. Radiation effects in amorphous semiconductor oxides, Romanian Space Agency grant, 2013-2016, PI, \$300,000
8. Mentor for two Post-Doc research grants (Dr. Prepelita and Dr. Dorcioman, each \$80,000)
9. In situ characterization of liquid steel composition, Partnership Program, Romania, 2014-2017, \$700,000
10. Romanian-RSA collaborative research agreement on new phosphorous materials, 2015-2017, \$ 8,000

#### **Specialized equipment knowledge**

X-ray diffraction systems and analysis techniques,  
Scanning Electron Microscopy  
Energy Dispersive X-ray Analysis

FTIR, Raman, VASE  
XPS and AES  
nanoindentation  
RBS, NRA  
Electrical characterization of thin films (four point, C-V, I-V)  
Pulsed laser deposition, magnetron sputtering, thermal evaporation, CVD  
LIBS

**Reviewer for various journals including:**

Applied Physics Letters, Journal of Applied Physics, Thin Solid Films, Applied Surface Science, Materials Science and Engineering A, Journal of Nano Research

**Reviewer for grant applications/grant evaluation:**

France, Romania, USA  
EMPA-Switzerland, 2017  
RSA, 2018

**Editorial Board:** Coatings and J. of Nano Research

**Member of the Scientific Committee of International Conferences**

1. E-MRS Spring Meeting, Symposium on Hard Coatings, Lille, May 2014.
2. E-MRS Spring Meeting, Symposium CC, Laser and plasma processing for advanced applications in material science – ( <http://www.european-mrs.com/2015-spring-symposium-cc-european-materials-research-society#sthash.oZCY5JH5.dpuf> ) Lille, May 2015.
3. EU-Korea workshop on Advanced Materials, Lille, May 2015
4. ROMOPTO, Bucharest 2015.
5. Lights of the World, Bucharest, 30th October - 1st November 2015, Palace of the Parliament
6. E-MRS Spring Meeting 2016, Symposium I, Functional oxynitride films for sustainable development – ( <http://www.european-mrs.com/2016-spring-symposium-i-european-materials-research-society#sthash.C9uTh44H.dpuf> )
7. E-MRS Spring Meeting 2016, Symposium EE, Carbon-, or nitrogen-containing nanostructured thin films –( <http://www.european-mrs.com/2016-spring-symposium-ee-european-materials-research-society#sthash.hzc223F3.dpuf> )
8. IC4N, 5<sup>th</sup> Edition, Greece, June 26-30, 2016
9. ICPEPA-10 Conference, 29 August-2 September 2016, Brasov, Romania