



Curriculum Vitae

Prof.dr. Daniel Vizman

Faculty of Physics

West University of Timișoara

1. Name: **Vizman**
2. Surname: **Daniel**
3. Date and place of the birth: **09.04.1968, Banloc, Timis, Romania**
4. Citizenship: **Romanian**
5. Marital status: **Married**
6. Education:

Institution	West University of Timisoara	West University of Timisoara
Period: from... (month, year) to...(month, year)	October 1986 – July 1991	March 1995 – June 1998
Title of qualification awarded	Licentiate in Theoretical Physics	Doctor in Physics

7. Scientific title: **Doctor in Physics**

8. Professional experience:

Period: from... (month, year) to... month, year)	October 1992 – October 1995	October 1995 – October 1998	October 1998 – October 2003	October 2003 – October 2008	October 2008 – Present
Place:	Timisoara	Timisoara	Timisoara	Timisoara	Timisoara
Institution:	West University of Timisoara, Faculty of Physics	West University of Timisoara, Faculty of Physics	West University of Timisoara, Faculty of Physics	West University of Timisoara, Faculty of Physics	West University of Timisoara, Faculty of Physics
Position:	Junior teaching Assistant	Teaching Assistant	Lecturer	Associate Professor	Professor
Description:	Optics	Optics, Classical Mechanics	Optics, Classical Mechanics	Classical Mechanics, Heat Transfer, Computational methods in transport phenomena	Heat Transfer, Computational methods in transport phenomena, Crystal growth processes

9. Professional affiliation:

- Secretary of the European Network for Crystal Growth (2012-2018)
- Romanian society for material science
- Humboldt Club member, Romania
- Romanian physical society

10. Foreign languages:

- English Very good
- German Good

11. Areas of specializations and qualifications: Crystal growth processes, Transport phenomena, Numerical modeling, Magneto hydrodynamics

12. Awards:

- "Young Scientist Award" for the paper "3D Numerical Simulation of melt flow in a Si-Czochralski melt under the Influence of a cusp-magnetic field. Comparison to experimental results" at the 13th International Conference on Crystal Growth, 2001, Kyoto, Japan
- "Excellence in reviewing" award, 2014, ELSEVIER
- "Constantin Miculescu" award of the Romanian Academy, 2014

13. Fellowships

- **DAAD fellow** (1995-1996), Institute for Material Science, University of Erlangen - Nuernberg, Germany
- **Humboldt fellow (1999 - 2000)**, Institute for Material Science, University of Erlangen - Nuernberg, Germany

14. Other specifications:

- Hirsch Factor 14, number of citation 472 (without auto-citation)
- PhD adviser since 2009, 9 PhD thesis finalized
- 2012-2016 – Director of the Doctoral School in Physics, West University of Timisoara
- 2016-2020 – Dean of the Physics Faculty, West University of Timisoara
- Invited lecturer at summer schools: International Summer School on Crystal Growth and Photovoltaic Materials, Brasov, Romania, 2012, 1st European Summer School on Crystal Growth, Bologna, Italia, 2015, International Summer School on Crystal Growth and Advanced Materials for Energy Conversion, Bucuresti, Romania, 2017, Laser ignition summer school, Brasov, Romania, 2017, 2st European Summer School on Crystal Growth, Varna, Bulgaria, 2018
- Member of the Scientific Committee at the 5th, 6th, 7th, 8th, 9th International Workshop on Modeling in Crystal Growth, 2006 (Germania), 2009(USA), 2012(Taiwan), 2015(Belgium), 2018(USA)
- Member of the Scientific Committee at the 5th, 6th European Conference on Crystal Growth 2015(Italy), 2018(Bulgaria), 18th International Conference on Crystal growth 2016(Japan).
- Chairman of the TIM14, TIM15-16 Physics Conference, Timisoara, Romania
- Co-Chairman of the Computational physics and complex phenomena modeling Workshop, 29-30 May 2008, Timisoara, Romania
- Scientific Evaluator in Research programs of Romanian National University Research Council

- Evaluator for National Science Foundation Bulgaria 2008,2009
- Invited seminars at Fraunhofer Institute, Erlangen, Germany and at the Institute for Crystal Growth (IKZ), Berlin, Germany
- Seminars and training sessions on modeling of crystallization processes for researchers from the Research and Development departments of world leading industry in Si and GaAs crystal growth;
- Book Chapter in Handbook of Crystal Growth: Bulk Crystal Growth, 2014, Pages 909-950, Elsevier
- The paper “*Large modification of crystal-melt interface shape during Si crystal growth by using electromagnetic Czochralski method (EMCZ)*, *Journal of Crystal Growth* 292 (2006) 252-256, Watanabe M, **Vizman D**, Friedrich J, Muller G ” was on 5th position in Top 25 – ScienceDirect (oct.-dec. 2007), Physics and Astronomy category (<http://top25.sciencedirect.com>)
- Cover page in Crystal Growth and Design, 12 (2012) 320 (impact factor 4.7)

15. Main contributions

The main results of my research in the last 25 years were in the field of crystallization processes both at laboratory and industrial scale. I was the leader of the group who develop STHAMAS3D program at the Fraunhofer Institute IISB, Erlangen, Germany (mainly during a Humboldt fellowship). This is used to optimize the crystal growth parameters in different crystal growth technologies. I was also active in the study of the influence of the magnetic field on the crystal growth processes.

In particularly I've obtained the next results:

- Growth and characterization of different crystals (fluoride and silicon)
- Design and build a model experiment to study the influence of a combination of static magnetic field and electrical current on the melt flow in semiconducting melts.
- 3D modelling and optimization of Vertical Gradient Freeze (VGF) process. Use of Rosseland approximation for the study of radiative heat transfer in semi-transparent crystals.
- 3D modelling and optimization of Si-Czochralski process. Prediction of temperature fluctuation in the melt for various crystal and crucible rotation rates. Comparison to experimental results.
- Prediction of the influence of different types of magnetic fields (vertical, horizontal and cusp) on the S-L interface shape and on melt flow in Czochralski, Bridgman and VGF crystal growth processes.
- Modeling of Oxygen transport in Czochralski method for obtaining Si single crystals.
- Modeling of Electromagnetic Czochralski process and comparison to experimental results on interface shape obtained at NEC, Japan.
- Study of the influence of the melt flow on the interface shape in a silicon ingot casting

process

- Modeling of the melt flow and interface shape in the industrial liquid-encapsulated Czochralski growth of GaAs
- During the years STHAMAS3D was used by the word leaders in production of Si and GaAs crystals.

Keywords: fluid mechanics, heat transfer, diffusion, magnetohydrodynamics, crystal growth methods, numerical computation, parallel computation., numerical methods (finite volume, finite element, lattice Boltzmann)

I, the undersigned, swear or affirm that the information I have supplied herein is true and accurate

Date 20.04.2020

Prof.dr. Daniel Vizman

List of ISI publications

1. Heat transfer analysis and structure perfection of shaped semi-transparent crystals
Journal of Crystal Growth 128 (1993) 152-158
I.Nicoara, D.Nicoara, D.Vizman
2. Interface Shape Studies of Fluoride and Silicon Rods Grown by the E.F.G. Method
Crystal Research and Technology 30 (1995) 1085-1093
I.Nicoara, D.Vizman
3. On the Factors Affecting the Isotherm Shape during Bridgman Growth of Semi-transparent Crystals
Journal of Crystal Growth 169 (1996) 161-169
D. Vizman, I. Nicoara, D. Nicoara
4. Thermal stresses in shaped semi-transparent crystals
Journal of Crystal Growth 169 (1996) 102-109
I.Nicoara, D. Vizman, D. Nicoara
5. On the solidification particularities of the opaque and semi-transparent crystals obtained by Bridgman method
Crystal Research and Technology 33 (1998) 207-218
I.Nicoara, Mirela Nicolov, Artur Pusztai, D.Vizman
6. Experimental and Numerical Study of Rayleigh-Benard Convection Affected by a Rotating Magnetic Field
Physics of Fluids 11 (1999) 853-861
J.Friedrich, Y.-S. Lee, B.Fischer, C.Kupfer, D.Vizman, G.Mueller

7. 3D Numerical Simulation of Melt Flow in the Presence of a Rotating Magnetic Field
International Journal of Numerical Methods for Heat and Fluid Flow 10 (2000) 366-384
D.Vizman, J.Friedrich, B.Fischer and G.Mueller
8. Effects of temperature asymmetry and tilting in the vertical Bridgman growth of semi-transparent crystals
Journal of Crystal Growth 212 (2000) 334-339
D.Vizman, I.Nicoara and G.Mueller
9. On void engulfment in shaped sapphire crystals using 3D modelling
Journal of Crystal Growth 218 (2000) 74-80
I.Nicoara, D.Vizman and J.Friedrich
10. Three-dimensional numerical simulation of thermal convection in an industrial Czochralski melt: comparison to experimental results
Journal of Crystal Growth 233 (2001) 687-698
D.Vizman, O.Graebner, G.Mueller
11. Comparison of the predictions from 3D numerical simulation with temperature distributions measured in Si Czochralski melts under the influence of different magnetic fields
Journal of Crystal Growth 230 (2001) 73-80
D.Vizman, J.Friedrich, G.Mueller
12. 3D numerical simulation and experimental investigations of melt flow in an Si Czochralski melt under the influence of a cusp-magnetic field
Journal of Crystal Growth 236 (2002) 545-550
D.Vizman, O.Graebner, G.Mueller
13. 3D Numerical simulation of Rayleigh-Benard convection in an electrically conducting melt acted on by a travelling magnetic field
V.Socoliuc, D. Vizman, B. Fischer, J. Friedrich, G. Mueller
Magnetohydrodynamics, 39(2003),2, 187-200
14. Three-dimensional modeling of melt flow and interface shape in the industrial liquid-encapsulated Czochralski growth of GaAs
Journal of Crystal Growth 266 (2004) 396-403
Vizman D, Eichler S, Friedrich J, Muller G
15. Voids engulfment in shaped sapphire crystals
Journal of Crystal Growth 287 (2006) 291-295
Nicoara I, Bunoiu OM, Vizman D
16. Numerical modeling of frequency influence on the electromagnetic stirring of semiconductors melts
Crystal Research and Technology 41 (2006), 645-652
C. Stelian, D. Vizman
17. Large modification of crystal-melt interface shape during Si crystal growth by using electromagnetic Czochralski method (EMCZ)

Journal of Crystal Growth 292 (2006) 252-256
Watanabe M, Vizman D , Friedrich J, Muller G

18. A new hybrid method for the global modeling of convection in CZ crystal growth configurations

Journal of Crystal Growth 303 (2007) 124-134
J. Fainberg, Vizman D, Friedrich J, Mueller G

19. 3D time-dependent numerical study of the influence of the melt flow on the interface shape in a silicon ingot casting process

Journal of Crystal Growth 303 (2007) 231-235
Vizman D, Friedrich J, Mueller G

20. Influence of different Types of magnetic fields on the interface shape in a 200mm Si-EMCZ configuration

Journal of Crystal Growth 303 (2007) 221-225
Vizman D, Watanabe M, Friedrich J, Mueller G

21. Numerical study of the influence of different types of magnetic fields on the interface shape in directional solidification of multi-crystalline silicon ingots

Journal of Crystal Growth 318 (2011) 293-297
Tanasie C, Vizman D, Friedrich J

22. Numerical study of the influence of melt convection on the crucible dissolution rate in a silicon directional solidification process,

Int. Journal of Heat and Mass Transfer, Volume 54, Issues 25-26 (2011) 5540-5544
A. Popescu, Vizman D.

23. Numerical study of the influence of melt convection on the crucible dissolution rate in a silicon directional solidification process.

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A. Popescu, Vizman D.

24. Numerical studies on a type of mechanical stirring in directional solidification method of multicrystalline silicon for photovoltaic applications,

Journal of Crystal Growth, 360 (2012) 76-80
Dumitrica S., Vizman D, Garandet J.P.

25. Numerical parameter studies of 3D melt flow and interface shape for directional solidification of silicon in a traveling magnetic field

Journal of Crystal Growth, 381 (2013) 169-178
D. Vizman, K. Dadzis, J. Friedrich

26. Novel method for melt flow control in unidirectional solidification of multi-crystalline silicon

Journal of Crystal Growth, 372 (2013) 1-8
D. Vizman, C. Tanasie

27. Unsteady coupled 3D calculations of melt flow, interface shape, and species transport for directional solidification of silicon in a traveling magnetic field

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K. Dadzis, D. Vizman, J. Friedrich

28. Effects of crucible coating on the quality of multicrystalline silicon grown by a Bridgman technique

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V. Pupazan, R. Negrila, O. Bunoiu, I. Nicoara, D. Vizman

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Negrila R.A, Popescu A., Vizman D.

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Liliana Lighezan, Adrian Neagu, Adriana Isvoran, Daniel Vizman

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Romanian Reports in Physics 68, S275-S347, 2016

T. Asavei, M. Tomut, M. Bobeica, S. Aogaki, M. O. Cernaianu, M. Ganciu, S. Kar, G.

Manda, N. Mocanu, L. Neagu, C. Postolache, D. Savu, D. Stutman, D. Vizman, D. Ursescu,

S. Gales, N. V. Zamfir

32. Nano-micro composite magnetic fluids: Magnetic and magnetorheological evaluation for rotating seal and vibration damper applications, Journal of Magnetism and Magnetic

Materials 406, 134-143, 2016

Oana Marinica, Daniela Susan-Resiga, Florica Balanean, Daniel Vizman, Vlad Socoliuc,

Ladislau Vekas

33. Numerical Study of Electromagnetic Stirring in a Cylindrical Configuration for Directional Solidification of Multi-Crystalline Silicon, Romanian Journal of Physics 62, 608,

2017

Alexandra Popescu, Stelian Arjoca, Daniel Vizman

34. Numerical study of the influence of forced melt convection on the impurities transport in a silicon directional solidification process, Journal of Crystal Growth 474, 55-60, 2017

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35. Numerical modeling of laser-driven ion acceleration from near-critical gas targets, Plasma Physics and Controlled Fusion 60, 064002, 2018

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36. Gamma-rays induced color centers in Pb^{2+} doped CaF_2 crystals, Radiat. Phys. Chem. 153 (2018) 70-78.

I. Nicoara, M.Stef, D. Vizman, C.D. Negut

37. Distribution of Yb^{3+} and Yb^{2+} Ions along YbF_3 -Doped BaF_2 Crystals

Crystal Research and Technology, 53, 12 (2018) 1800186

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38. Gamma-rays induced color centers in Pb^{2+} doped CaF_2 crystals

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39. Influence of growth conditions on the optical spectra of gamma irradiated BaF_2 and CaF_2 crystals

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I Nicoara, M. Stef, D Vizman

40. Influence of target curvature on the characteristics of particle beams generated by laser ion acceleration with microstructured enhanced targets at ultra high intensity

Physics and Controlled Fusion 61,11 (2019) 114004

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41. Influence of Pb^{2+} ions on the optical properties of gamma irradiated BaF_2 crystals

Radiation Physics and Chemistry, 168 (2020) 108565

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