

**Author: Cretu Nicolae Constantin**

**Title of habilitation thesis: *Contribution to the progress and applications of some numerical methods used in computer simulation of elastic waves and pulses propagation in homogeneous and inhomogeneous media***

**Domain: Materials Engineering**

## **SCIENTIFIC REPORT**

### **RELEVANT SCIENTIFIC PAPERS**

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1. **Cretu, N.**, Delsanto, P.P., Nita, G., (...), Scalerandi, M., Sturzu, I.-Ultrasonic pulse propagation in inhomogeneous one-dimensional media,  
**Journal of the Acoustical Society of America** 104 (1), 1998, pp. 57-63
2. **Cretu, N.**, Nita, G.-Pulse propagation in finite elastic inhomogeneous media  
**Computational Materials Science** 31 (3-4), 2004, pp. 329-336
3. **Cretu, N.**-Acoustic measurements and computational results on material specimens with harmonic variation of the cross section,  
**Ultrasonics** 43 (7), 2005, pp. 547-550
4. **Cretu, N.**, Nita, G., Boer, A.- $\Delta E$  effect for polycrystalline ferromagnetic rods  
**IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control** 55 (2), 2008, pp. 415-420
5. **Cretu, N.**, Pop, M.-I.-Acoustic behavior design with simulated annealing  
**Computational Materials Science**, 44 (4), 2009, pp. 1312-1318
6. **Nicolae, Cretu.**, Gelu, Nita.-A simplified modal analysis based on the properties of the transfer matrix,  
**Mechanics of Materials** 60, 2013, pp. 121-128
7. **Cretu, N.**, Nita, G., Ioan Pop, M.-Wave transmission approach based on modal analysis for embedded mechanical systems  
**Journal of Sound and Vibration**, 332 (20), 2013, pp. 4940-4947
8. **Cretu, N.**, Pop, I.M.-Higher order statistics in signal processing and nanometric size analysis  
**Journal of Optoelectronics and Advanced Materials**, 10 (12), 2008, pp. 3292-3299
9. **Nicolae Cretu**, Mihail Ioan Pop, Attila Boer-Quaternion Formalism for the Intrinsic Transfer Matrix (<http://www.sciencedirect.com/science/article/pii/S1875389215008913>)  
**Physics Procedia** 70, 2015, 262-265
10. Croitoru, C., Patachia, S., **Cretu, N.**, Boer, A., Friedrich, C.-Influence of ionic liquids on the surface properties of poplar veneers  
**Applied Surface Science** 257 (14), 2011, pp. 6220-6225

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## PhD Thesis

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**Contributions to the study of the properties of some polycrystalline ferrites and of their behaviour in microwave circuits.**

Scientific coordinator: Research Professor Octav Gheorghiu  
Institute of Atomic Physics Bucharest-Magurele

## PATENTS

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**Magnetic Integrator Fluxmeter FIM 02**- University Transilvania Brasov  
(Cretu N ) Metrological approval nr 285/5286/1991 CNSMC

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## BOOKS/ CHAPTERS IN BOOKS

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### CHAPTERS IN BOOKS

1. **Computational acoustics and its environmental applications II** : ISBN 1-85312-459-1 ; Editor / Publisher **Computational Mechanics Publications, Southampton, ROYAUME-UNI** (1997) , Scalerandi, Marco, **Cretu, Nicolae**, Chiriacescu, Sergiu T., Sturzu, I., Rosca, Calin- A method for simulation of Gaussian pulse propagation in an elastic medium with periodical inhomogeneity, **pp. 161-168**
2. **Integral methods in science and engineering**, ISBN 1-58488-146-1 Editor / Publisher CHAPMAN AND HALL CRC, **N.Cretu**, G.Nita, I. Sturzu, C. Rosca- A semi-analytic method for the study of acoustic pulse propagation in inhomogeneous elastic 1-D media, **pp.107-112.**
- 3 ( <https://books.google.ro/books>)

### BOOKS

1. **Nicolae Cretu , Fundamentals of Physics** – Publisher Transilvania University Brasov,-ISBN 978-973-598-716-9, 2010 (in romanian)
2. **Nicolae Cretu , Physics for Engineers-**, Publisher Transilvania University Brasov,, ISBN 978-606-19-0062-6, 2012 (in romanian)
3. **Nicolae Cretu-General Physics-** Didactical and Pedagogical Publishing House Bucharest, ISBN 973-30-2502-X , 2003 (in romanian)
4. **Nicolae Crețu- Physics and technic of microwaves-** Publisher Transilvania University Brasov ,ISBN 973-635-840-2 (978-973-635-840-1, 2006 (in romanian)
5. **Nicolae Cretu, Ioan. Sturzu-Electrodynamics and Theory of Relativity-vol.I--** Publisher AXA Bucharest, ISBN 973-97408-4-7 , Bucharest,1998 (in romanian)
6. **Nicolae Cretu, Physics**, Publisher Transilvania University Brasov,ISBN 978-973-598-369-7,2008 (in romanian)

7. **Nicolae Crețu, Physics, Course for students at part-time education**, Departamentul pentru Invățământ la Distanță și Invățământ cu Frecvență Redusă, Nicolae Crețu, Reprografia Univ Transilvania Brasov 2008, 173 pagini
- 8 **Nicolae Crețu-Fizica, Distance learning course**, Departamentul pentru Invățământ la Distanță și Invățământ cu Frecvență Redusă, Nicolae Crețu, Reprografia Univ Transilvania Brasov 2008, 159 pagini

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**SCIENTIFIC PAPERS IN ISI and BDI JOURNALS**

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1. I C Rosca, M. Pop and **N.Cretu**-Experimental and computational studies on a ultrasonic horn with shape designed by optimization ([10.1016/j.apacou](https://doi.org/10.1016/j.apacou)), **Applied Acoustics** ,95,2015,pp60-69
2. Sava, F., Lorinczi, A., Velea, A., **Crețu, N.-C.**, Popescu, M.-Effect of thermal annealing on the structural and optical properties of Ag/As<sub>2</sub>S<sub>3</sub> multilayers, **Chalcogenide Letters** 10 (11),2013, pp. 467-472
3. **Crețu, N.**, Pop, M.-I.-Some considerations on the magnetoacoustic effect of ferromagnetic elastic carbon steel rods, **International Journal of Microstructure and Materials Properties**, 6 (3-4), 2011,pp. 273-282
4. Cristea D, Crisan A, **Crețu N**, Borges J, Lopes C, Cunha L, Ion V, Dinescu M, Barradas N. P., Alves E, Apreutesei M, Munteanu D-Structure dependent resistivity and dielectric characteristics of tantalum oxynitride thin films produced by magnetron sputtering, **Applied Surface Science** 354,2015, pp.298-305
5. Vlaicu, A.M., Mercioniu, I., Vasile, B.S., **Crețu N**, Nita, P., Popescu-Pogriion, N.-Structural and chemical properties of cerium-magnetoplumbite in cerium based IT-SOFC compounds, **Optoelectronics and Advanced Materials, Rapid Communications**,5 (1-2),2011, pp. 143-145
6. **Crețu N**-On the behaviour of a ferrimagnetic sample in a microwave field with a determinate geometry, **Metallofizika i Noveishie Tekhnologii**, 20 (4),1998 pp. 10-15

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**SCIENTIFIC PAPERS IN ISI PROCEEDINGS**

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- 1.**Crețu, N.**, Pop, I.-M., Rosca, I.-C.-Eigenvalues and eigenvectors of the transfer matrix, **AIP Conference Proceedings ICU Gdansk, 5-8 september 2011**, pp 535-538, <http://dx.doi.org/10.1063/1.3703244>
2. **Crețu, N.**-Some considerations on the magnetoacoustic effect of ferromagnetic elastic carbon steel rods, NDT in Progress: **4th International Workshop of NDT Experts, Proceedings; European NDT Days in Prague 2007**,pp. 43-50 ISBN 978-80-214-3505-6
3. **N Crețu**, G Nita, A Boer, M Pop -HIGHER ORDER STATISTICS IN MAGNETOACOUSTIC NDT, Proceedings of Vth International Workshop of NDT Experts, ISBN 978-80-214-3968-9 , p.19-27, **NDT in Progress 2009, October 12-14, Prague, Czech Republic** , [http://www.ndt.net/article/Prague2009/ndtip/proceedings/Crețu\\_8.pdf](http://www.ndt.net/article/Prague2009/ndtip/proceedings/Crețu_8.pdf)

4. Bibicu I, Nicolescu G, **Cretu N.C**-A versatile gas-flow proportional counter for Mossbauer spectroscopy, *Hyperfine Interactions* , 192(1-3), 2009, 85-91
5. Bibicu, I., Nicolescu, G., **Cretu, N.**-Mössbauer backscattering measurements on Sn  
Proceedings of SPIE - **Advanced Topics in Optoelectronics, Microelectronics, and Nanotechnologies IV, 2971T**(January 07, 2009, The International Society for Optical Engineering 7297, 72971T doi:10.1117/12.823676, 2009  
<http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=1337648>
6. **Nicolae Cretu**, Gelu Nita, Attila Boer- Acoustic behavior of finite ferromagnetic samples, .Paper #1032 presented at **the International Congress on Ultrasonics, Vienna, April 9 - 13, 2007**, Session R21: doi:10.3728/ICUltrasonics. 2007.Vienna.1032\_cretu
7. I. Curtu, M. Stanciu, **N. Cretu**, I. Rosca-Modal analysis of different types of classical guitar bodies, **Proceedings of 10th International WSEAS Conference on Acoustics&Music, 2009**, pp30-35, ISBN  
[http://www.researchgate.net/profile/Mariana\\_Stanciu/publication/228660225\\_Modal\\_analysis\\_of\\_different\\_types\\_of\\_classical\\_guitar\\_bodies/links/02bfe50fd09693c696000000.pdf](http://www.researchgate.net/profile/Mariana_Stanciu/publication/228660225_Modal_analysis_of_different_types_of_classical_guitar_bodies/links/02bfe50fd09693c696000000.pdf)

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#### OTHER RELEVANT ACHIEVEMENTS

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1. Coordinator of the research laboratory: **Physical Acoustics Laboratory** from the Department of Electrical Engineering and Applied Physics
2. Coordinator of laboratory **CAP (Computational and Applied Physics)** part of the research center SEA-ICDT Transilvania University
3. Coordinator of the team **Wave propagation and Computer Simulation** from the Department of Electrical Engineering and Applied Physics
4. Member of Scientific Committee and of the Organizing Committee of some International Conferences held in Brasov (**ROCAM, ANC, ALT, PROGRESS IN PHYSICS**) .
5. Coordinator of **Forum of Physicists from Brasov** (<http://menelaus.unitbv.ro/forum>)
6. Member in the Scientific Committee of the International Conference **11<sup>th</sup> European Conference on Non-Destructive Testing, Octombrie 6-10, 2014, Prague, Czech Republic** (<http://www.ecndt2014.com/Text/main-page?MenuItemId=1>)

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