Publications List

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1 Categorized List of Publications

1.1 Books, Edited Volumes and Encyclopedic Entries


¹ Based on the Workshop at the 3rd M.I.T. Conference on Computational Fluid and Solid Mechanics
22. [EB-17] Nonlinear Analysis, Special Issue: Modelling, control and analysis of coupled problems, processes and phenomena (the forth world congress of nonlinear analysts), Eds. Melnik, RVN, Smith, R., Shillor, M., 63(5-7), 2005.


24. [EB-15] Mathematics for Industry in Denmark, Melnik, R.V.N., ECMI Newsletter, Number 34, October, 2003: This item is in the Contributions to the Community & Educational Books Category.


26. [EB-13], [EB-12], [EB-11], [EB-10], [EB-9]: These items are in the Contributions to the Community & Educational Books Category.


29. [EB-6], [EB-5], [EB-4], [EB-3]: These items are in the Contributions to the Community & Educational Books Category.


31. [EB-1]: This item is in the Contributions to the Community & Educational Books Category.

1.2 Papers in Archival Refereed Journals


33. [EJ-279] Microscopic dynamics modeling unravels the role of asymptomatic virus carriers in SARS-CoV-2 epidemics at the interplay between biological and social factors (with Tadic, B.), submitted 2021 (the medRxiv version can be found at doi: https://doi.org/10.1101/2021.02.01.21250926).

34. [EJ-278] A coupled neuronal-glial model for analyzing the effect of temperature on calcium-


40. [EJ-272] The topology of higher-order complexes associated with brain hubs in human connectomes (Andjelkovic, M., Tadic, B. and Melnik R), Scientific Reports, 10, 17320, 2020, DOI: https://doi.org/10.1038/s41598-020-74392-3


46. [EJ-266] Coarse-Grained Models of RNA Nanotubes for Large Time Scale Studies in


68. [EJ-244] Improving the performance of lead-free piezoelectric composites by using polycrystalline inclusions and tuning the dielectric matrix environment (with Krishnaswamy, J. A., Buroni, F. C., Garcia-Sanchez, F., Rodriguez-Templeque, L.,

69. [EJ-243] High bond difference parameter-induced low thermal transmission in carbon allotropes with sp(2) and sp(3) hybridization (with Feng, Z., Dong, H., Ju, S., Wen, B., Zhang, Y.), Physical Chemistry Chemical Physics, 21 (23), 12611-12619, DOI: 10.1039/c9cp01029g, 2019.


78. [EJ-234] Wettability alteration of calcite oil wells: Influence of smart water ions (with Prabhakar, S.), Scientific Reports, 7, Art. 17365, DOI: 10.1038/s41598-017-17547-z,


83. [EJ-229] Low thermal conductivity in Si/Ge hetero-twinned superlattices (with Dong, H., Wen, B. Zhang, Y.), RSC Advances (Royal Society of Chemistry), 7 (48), 29959-29965, 2017


90. [EJ-222] On the Perturbation Methods for Vibration Analysis of Linear Time-Varying
Professor Roderick Melnik


102. [EJ-210] Relaxation of electron-hole spins in strained graphene nanoribbons, Prabhakar, S.


114. [EJ-198] Relative importance of grain boundaries and size effects in thermal conductivity of nanocrystalline materials, Dong, H., Wen, B. and Melnik, R., Scientific Reports, 4, 7037,
2014.


150. [EJ-162] Temperature dependent elastic constants for crystals with arbitrary symmetry:


186. [EJ-126] Field Effect of Internal Viscosity of Polymeric Fluids Under Strong Extensional


210. [EJ-102] Model-Based Analysis and Simulation of Airflow Control Systems of Ventilation Units in Building Environments (Wu, Z., Melnik, RVN, Borup, F.), Building and Environment,


\[ \text{\textsuperscript{2}} \text{Also was selected and published in the Electronic Journal of Nanoscale Science and Technology, Aug 1, 2005.} \]


247. [EJ-65] Finite Element Analysis of Coupled Electronic States in Quantum Dot

³ Based on the contribution to the XIth CTAC.


259. [EJ-53] Fully Conservative Difference Schemes for Nonlinear Models Describing Dynamics of Materials with Shape Memory (with Matus, P.P. and Rybak, I.V.), Dokl. of the Academy of

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4 Also was selected and published in the Electronic Journal of Nanoscale Science and Technology, Oct 18, 2004.


272. [EJ-40] Coupled Thermomechanical Waves in Hyperbolic Thermoelasticity (with Strunin,


1.3 Full Paper Contributions to Edited Volumes, Refereed
Professors Roderick Melnik

Conference Proceedings, and Book Chapters


372. [EP-108] Gate control of single electron spins through Lande g-factor in InAs quantum dots, Prabhakar, S., Melnik, R., Proceedings of the 5th International Conference on


380. [EP-100] Evolutionary Monte Carlo Based Techniques for First Passage Time Problems in Credit Risk and Other Applications in Finance, Tsviliuk, O., Melnik, R., Zhang, D., in


397. [EP-83] Phase Transformations in Finite Length Nanowires: Analysis with Mesoscopic


415. [EP-65] Mesoscopic model for electroactive composite films and its applications, Mahapatra,


454. [EP-26] Nonlinear Coupled Thermomechanical Waves: Modelling Shear Type Phase


1.4 Textbooks, Contributions to the Community and STEM Education

[ STEM = Science, Technology, Engineering and Mathematics ]


488. [EB-8], [EB-7] These items are in the General Books Category.


493. [EB-2] This item is in the General Books Category.


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This is the only un refereed book in this list. I was the Editor of that edition (the book was written by R. Addie and A. Plank) and the examiner of the Unit in that year.
495. [OC-5] Problem Section Contributions, Quantum\textsuperscript{6}, 10, 14, 1979.
496. [OC-4] Problem Section Contributions, Quantum, 3, 36, 1980.
498. [OC-2] Problem Section Contributions, Quantum, 9, 21, 1980.

1.5 Refereed Reports and Theses

[Scientific Roots]\textsuperscript{7}


\textsuperscript{6} As a high school student I was a contributor to the Journal “Quantum (Kvant)” which, according to The London Math. Society Newsletter (see No. 279, 2000, pp.25–26), “had a big influence on mathematics and physics education in the Soviet Union. Even though this was a a popular magazine often aimed at high school students the authors included many of the leading Soviet mathematicians, for example, A. Alexandrov, P. Alexandrov, V. Arnol’d, I. Bernstein, V. Boltyanskii, A. Fomenko, D. Fuchs, S. Gindikin, A. Katok, A. Krillov, A. Kolmogorov, M. Krein, Yu. Matiyasevich, L. Pontryagin, V. Tikhomirov, N. Vilenkin”.

\textsuperscript{7} My scientific genealogy roots go to the “Luzitania” via M.N. Mosklakov, A.A. Samarskii, A.N. Tikhonov, and P.S. Aleksandrov (A. Tikhonov, L. Pontryagin, A. Kurosh were Alexandrov’s students). Pavel Alexandrov was amongst the first students of N.N. Luzin; other students of N.N. Luzin included P. S. Urysohn, A. N. Kolmogorov, M. Lavrentjev, and many other prominent scientists and mathematicians.

Through the “Luzitania”, my scientific ancestors include Weierstrass, Gauss, and others interesting folks. You can learn more about the “Luzitania” at this page.


1.6 Technical Reports, Working Papers, and Reports to Industry


1.7 Invited Lectures, Extended Abstracts, and Other Conference Contributions


596. [AC-4-2016] Properties of graphene nanostructures accounting for thermomechanical effects (with S. Prabhakar), SPIE Photonics (Nanophotonics, Session: Quantum and Nonlinear Optics in Nanostructures), Brussels, April 4-7, 2016.


598. [AC-2-2016] Pseudospin dephasing in relaxed-shape armchair graphene nanoribbons (with S. Prabhakar and L. Bonilla), APS Meeting, Baltimore, Maryland, USA (Bulletin of the American Physical Society), March 14-18, 2016.

599. [AC-1-2016] Control and high magnetic field sensitivity of geometric phases and phonon-mediated spin relaxation rates in quantum dots (with S. Prabhakar), PPHMF-8 (Physical Phenomena at High Magnetic Fields), Tallahassee, USA, January 6-9, 2016.


602. [AC-12-2015] Electromechanical effects and their influence in controlling susceptibility of quantum dots (Invited Talk),


[AC-11-2014] Tuning Vibration Frequencies with Shape Memory Alloys in Precision Engineering Applications (with A. Sebetci and L. Wang), The 14th EUSPEN International Conference, Dubrovnik, June 2-6, 2014.


[AC-1-2014] Computational models for the Berry phase in semiconductor quantum dots (with S. Prabhakar and A. Sebetci), The 10th International Conference of Computational Methods in Sciences and Engineering (Symposium on Theory, Modeling, Investigation and Simulation of Low-Dimensional Systems), Athens, April 4-7, 2014.


Plenary One-hour Talk.


656. [AC-8-2011] Manipulation of single electron spins through Lande g-factor in InAs quantum dots (with S. Prabhakar), The 5th International Scientific Conference on Physics and Control, September 5 - 8, 2011.


663. [AC-2-2011] Gate control of a single electron spin in quantum dots through the application of a geometric phase (with S. Prabhakar), Workshop on Quantum Control, BIRS, April 3-8, 2011.


666. [AC-21-2010] Ellipticity conditions in multiband Hamiltonian problems for the analysis of low dimensional nanostructures (with D. Sytnyk), International Conference on Functional Analysis (dedicated to the 90th anniversary of V. E. Lyantse), L'viv University, November 17 - 21, 2010.


672. [AC-15-2010] Stress induced polarization switching and coupled hysteretic dynamics in ferroelectric materials, Wang, L.,


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698. **[AC-7-2009]** Effect of thermal stresses on electronic properties of GaN/AlN nanowire superlattices (with S. Patil), The 8th International Congress on Thermal Stresses, June 1-4, 2009, University of Illinois, Urbana-Champaign.


Conference on Computational Structures Technology and The Sixth International Conference on Engineering Computational Technology, Athens, Greece, September 2-5, 2008.


728. [AC-1-2008] Studying Properties of RNA Nanostructures and Their Potential Applications, Fields Institute, Invited talk (audio presentation is available from the Fields website) at the Workshop on Quantitative Cancer Modelling: Mathematical Models, Imaging and Bioinformatics, August 27, 2008: This item is in the Colloquium Presentation Section.


[AC-16-2006] Modelling dynamics of nonlinear thermomechanical phase transformations in multidimensional shape memory alloy samples (with D.R. Mahapatra and L. Wang), The 6th International Conference on Dynamical Systems and Differential Equations, University of Poitiers, France, June 25-28, Special Session on "Convex/Nonconvex Dynamical


773. [AC-20-2005] Simulation of nonlinear thermomechanical waves with an empirical low dimensional model (Wang, L. and Melnik RVN), The 5th International Conference on Computational Science (ICCS-2005), Atlanta, GA, USA, May 22-25,
2005.


845. [AC-7-1997] Steklov’s Operator Technique in Coupled Dynamic Thermoelasticity, The 10th International Conference on


1.8 Some Invited Departmental & Colloquia Presentations, Networking Events


See more at this site.


886. [IP-77] Models for developing surface haptic technology in applications ranging from mobile devices and laptops to home appliances and to automobile industry (with Dr.Maria Soledad Commiss, Hap2U Company, in collaboration with the group of Prof. Andres Saez), July 4, 2019.


892. [IP-71] Focus Program on Nanoscale Systems and Coupled Phenomena: Mathematical Analysis, Modeling, and Applications (with Bjorn Birnir, Ana Carpio, and Mitchell Luskin), Field Institute, April 1 – May 31, 2018.


899. [IP-64] Multi-phase materials and coupled nonlinear models in science and engineering applications, Tubitak-supported talk at University, Konya (Organizer: Prof. A. Sebetci), March 20, 2014.


903. [IP-60] Coupled Mathematical Models for Multi-Phase Materials: Nonlinear Dynamics and Numerical Approximations,
907. [IP-56] Workshop on the Genedes and Design projects funded by Tekes (Finish Funding Agency for Technology and Innovation), University of Jyväskylä, May 4, 2011.


928. [IP-35] 3D Phase Transformations, Syddansk University, Denmark, 16-12, 2005.

929. [IP-34] Workshop on Emergence of Spacetime, Perimeter Institute for Theoretical Physics, November 18, 2005.


941. [IP-22] Call for Chair in Mathematics, Division of Information and Communication Sciences, Macquarie University (Sydney), November 2001.

942. [IP-21] Call for Professorship, Department of Mechanical Engineering, North Dakota State University, USA, November 2001.


946. [IP-17] Introduction to Coupled Field Theory, Endowed Chair Finalist Lecture Series, Georgia Southern University, USA, May 2001.

1.9 Abbreviations for Categories

- **EJ** - Refereed Journal Contributions
- **EB** - Books and Editorials
- **EP** - Refereed Conference Proceedings
- **AC** - Extended Abstracts, Invited Lectures
- **RR** - Refereed Reports
- **TH** - Research Degree Theses
- **TR** - Technical Reports and Working Papers
• OC - Papers on Education and Other Contributions
2 Publications Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
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<tbody>
<tr>
<td>Books, Edited Volumes, Encyclopedic Entries:</td>
<td>38</td>
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<tr>
<td>Publications in Refereed Journals:</td>
<td>280</td>
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<tr>
<td>Full Papers in Refereed Conference Proceedings and Book Chapters:</td>
<td>170</td>
</tr>
<tr>
<td>Textbooks, Contributions to the Community and STEM Education:</td>
<td>20</td>
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<tr>
<td>Refereed Reports and Theses:</td>
<td>12</td>
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<tr>
<td>Technical Reports, Working papers, and Reports to Industry:</td>
<td>30</td>
</tr>
<tr>
<td>Extended Abstracts and Other Conference Contributions:</td>
<td>336</td>
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<tr>
<td>Total:</td>
<td>886</td>
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Over the years, multiple news, videos, and outreach articles about research achievements, activities, and projects of Dr. Melnik and his group have been released in press and online. There are also numerous scientific repositories made to the world’s leading data centers and scientific databases such as the Cambridge Crystallographic Data Centre (CCDC) and others. 

http://www.m3ai.wlu.ca/

Last Updated: March 10, 2021

See also some of the presentations in Section 1.8, not included otherwise.

Further, not included in the table are multiple scientific repositories made to the world’s leading data centers and scientific databases such as the Cambridge Crystallographic Data Centre (CCDC) and others.