

Curriculum Vitae, Dr. Vadym Mochalin

Dr. Vadym Mochalin,
Associate Professor,
Department of Chemistry,
Missouri University of Science &
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Professional experience	2
Field of research.....	2
Recent honors and awards	3
Professional memberships.....	3
Editor/editorial board member	3
Reviewer/Referee	4
Conference/symposium organizer and session chair	4
Unsolicited coverage in media.....	5
Grants awarded.....	5
User facilities and other grants awarded.....	6
Peer reviewed journal publications (submitted, accepted or published; three additional papers currently in preparation)	6
Book chapters (invited to write three more book chapters).....	12
Patents	12
Talks, seminars, and conference presentations	13

Professional experience

Associate Professor 8/2015 - Present
Department of Chemistry, Missouri University of Science and Technology, Rolla, Missouri.

Teaching classes in physical chemistry and supervising a group of four students and three post-docs. Research focus: materials for extreme environments, novel 2D materials (2D transition metal carbides/nitrides - MXenes), nanodiamond. Development and chemical modification of materials for energy storage, composites, and biomedical applications. Computational modeling of materials.

Associate Research Professor 6/2012 – 8/2015
Department of Materials Science and Engineering, Drexel University and A. J. Drexel Nanomaterials Institute, Philadelphia, Pennsylvania.

Teaching classes and supervising a group of five students and one post-doc. Current primary research focus is in synthesis, characterization, and modification of novel 2D materials (MXene) and nanodiamond for energy storage and biomedical applications. Nanodiamond is one of the most promising materials for design of theranostic platforms. Particularly, nanodiamond is researched for drug delivery across the brain blood barrier, imaging, and diagnosis of brain tumors and neurodegenerative diseases. MXene is a new large family of 2D transition metal carbides and nitrides, dramatically extending the world of 2D materials beyond graphene.

Assistant Research Professor 8/2009 - 5/2012
Department of Materials Science and Engineering, Drexel University and A. J. Drexel Nanomaterials Institute, Philadelphia, Pennsylvania.

Taught classes and supervised a group of four students. Developed nanodiamond-polymer composites for biomedical and structural applications, biodegradable nanodiamond poly-(L-lactic acid) composites for tissue engineering and bone surgery. Designed carbon nanoions for high power supercapacitors and other energy storage applications. Performed atomistic molecular dynamics studies of nanodiamond transformation into carbon nanoions.

Co-founder, NanoWound Devices, Inc. 11/2011

Field of research

- Nanomaterials: synthesis, characterization, purification, chemical functionalization, and surface modification for biomedical, electronic, composite, and energy applications
- Theranostic platforms and drug delivery for ocular, anticancer, and neurological applications
- New two-dimensional materials (graphene nanoscrolls, 2D carbides and nitrides - MXene): synthesis, characterization, studies of reactivity, chemical modification, modeling, and applications for energy storage, catalysis, and composites
- Nanodiamond-reinforced polymer composites for structural, energy, and thermal management applications
- Biodegradable nanocomposites for tissue engineering and surgery
- Computational modeling of materials

Recent honors and awards

- 10/2023 **Ranked among top 2% researchers worldwide** in their fields for career and single-year impact by Stanford University study (3rd consecutive year)
(<https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/6>)
- 12/2022 Named **Fellow of the Royal Society of Chemistry**
- 10/2022 **Ranked among top 2% researchers worldwide** in their fields for career and single-year impact by Stanford University study (2nd consecutive year)
(<https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/4>)
- 08/2021 **Ranked among top 2% researchers worldwide** in their fields for career and single-year impact by Stanford University study
(<https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/3>)
- 04/2021 **Certificate in Effective College Instruction** from the Association of College and University Educators and the American Council on Education
(https://lms.acue.org/RoC/award_pdf.php?id=VmFkeW0rTW9jaGFsaW4lMkYxNjE4OTc1MTk2&uid=20638&cid=1221)
- 11/2020 **The 2020 Missouri S&T Faculty Research Award** in recognition of excellence in research and scholarship (<https://news.mst.edu/2020/11/missouri-st-faculty-honored-for-excellence-in-teaching-research-and-service-2/>)
- 02/2018 **One of the six Nanotechnology Highlights of 2017 in Topical Reviews** K. Turcheniuk and V. N. Mochalin “Biomedical applications of nanodiamond”, **Nanotechnology**, **28**, 252001 (2017)
(<http://iopscience.iop.org/journal/0957-4484/page/Highlights%202017>)
- 09/2016 **One of the top 10 most often downloaded papers** V. N. Mochalin, O. Shenderova, D. Ho, Y. Gogotsi “*The Properties and Applications of Nanodiamonds*”, **Nature Nanotechnology**, **7** (1), p.11-23 (2012) (<http://www.nature.com/nnano/topten/index.html>)
- 09/2014 **Best Poster Award** (*P-15 Two-Dimensional Transition Metal Carbides for Energy Storage Application*, O. Mashtalir, M. Naguib, V. N. Mochalin, et al.) at the 6th PCGMR-NCKU Symposium Nanotechnology/Materials for Future Devices, BioMedical Applications, Taiwan
(<https://sites.google.com/site/6thpcgmr/home>)
- 05/2014 Quoted and asked to comment about the work of others at **PhysicsWorld**
(<http://physicsworld.com/cws/article/news/2014/may/28/structural-supercapacitors-take-a-load-on>)
- 02/2014 **Inside Front Cover Image** “*MXenes: A New Family of Two-Dimensional Materials*”, **Advanced Materials**, **26**, 7 February (2014)
(<http://onlinelibrary.wiley.com/doi/10.1002/adma.201470041/abstract>)

Professional memberships

- Royal Society of Chemistry (RSC) fellow, 2022 – present
- American Chemical Society (ACS), 2008 – present
- Materials Research Society (MRS), 2008 – present
- American Physical Society (APS), 2017 – present
- American Ceramic Society (ACerS), 2019 – present

Editor/editorial board member

- Editor of *Diamond & Related Materials* (Elsevier), 2021 – present
- Editorial Board Member of *Scientific Reports* (Nature Publishing Group) 2012 – present

Reviewer/Referee

- **Journals:** Science, Nature Communications, Scientific Reports, Journal of the American Chemical Society, Angewandte Chemie, Advanced Materials, Advanced Functional Materials, Advanced Energy Materials, Chemical Communications, Applied Physics Letters, ACS Nano, Langmuir, Journal of Materials Chemistry A, Journal of Materials Chemistry B, The Journal of Physical Chemistry, Journal of Materials Chemistry, Journal of Chemical Information and Modeling, Chemistry - A European Journal, Chemical Physics Letters, Diamond and Related Materials, Nanotechnology, Carbon, Journal of Electro-Analytical Chemistry, Journal of Vacuum Science and Technology B, Colloids and Surfaces A, etc.
- **Funding agencies:** National Science Foundation, USA; National Science Centre (Narodowe Centrum Nauki), Poland; Czech Science Foundation, Czech Republic; Ministry of Education and Science of the Russian Federation, «Mega-grants Program»; United States-Israel Binational Science Foundation (BSF); Russia-Israel Scientific Research Cooperation; Israeli Ministry of Science; ACS Petroleum Research Fund, USA; Natural Sciences and Engineering Research Council of Canada

Conference/symposium organizer and session chair

- Co-Organizer, 16th New Diamond and Nano Carbons Conference, 18 – 22 June 2023, East Lansing Michigan, USA (<https://www.ndnc2023.org/>)
- Member of Scientific Committee, Carbon 2023 16 – 21 July 2023, Cancun, Mexico (<https://www.carbon2023.org/Committees#module671285>)
- Lead Symposium Organizer, 2021 Beilstein Nanotechnology Symposium on Nanodiamonds, March 2021, Mainz, Germany (postponed due to COVID)
- Conference Committee Member, 31th International Conference on Diamond and Carbon Materials (sponsored by Elsevier), 6 - 9 September 2021, Zoom, Internet
- Conference Committee Member, 30th International Conference on Diamond and Carbon Materials (sponsored by Elsevier), 8 - 12 September 2019, Melia Lebreros, Seville, Spain
- Symposium Organizer (Symposium NM06: Nanodiamonds - Synthesis, Characterization, Surface Chemistry and Applications), 2018 MRS Spring Meeting and Exhibit, 2018, Phoenix, Arizona
- Program Committee Member, New Diamond and Nano Carbons Conference, 2018, Flagstaff, Arizona
- Conference Committee Member, 29th International Conference on Diamond and Carbon Materials (sponsored by Elsevier), September 2-6, 2018, Dubrovnik, Croatia
- Conference Committee Member, 28th International Conference on Diamond and Carbon Materials (sponsored by Elsevier), September 3-7, 2017, Gothenburg, Sweden
- Lead Symposium Organizer (Symposium NT-5: Nanodiamonds - Fundamentals and Applications), 2016 MRS Spring Meeting and Exhibit, March 28 - April 1, 2016, Phoenix, Arizona
- Symposium Organizer (Symposium PP: Nanodiamonds - Fundamentals and Applications), 2014 MRS Spring Meeting and Exhibit, April 21-25, 2014, San Francisco, California
- Session Chair (Oral Session 26: Nanodiamond 2), Elsevier International Conference on Diamond and Carbon Materials, September 2-5, 2013, Riva del Garda, Italy
- Session Chair (Session FF4: Biomedical Applications of Nanodiamond Particles, Symposium FF: Nanodiamond Particles and Related Materials - From Basic Science to Applications), 2012 MRS Spring Meeting and Exhibit, April 9-13, 2012, San Francisco, California
- Session Chair, NanoDiamond'2008, 1-4 July, 2008, St. Petersburg, Russia

Unsolicited coverage in media

<http://www.sciencedaily.com>

<http://phys.org/news/2015>

<http://www.newswise.com>

<http://www.naturetimes.com>

<https://www.nanowerk.com>

<http://www.iom3.org/>

<http://www.phelpscountyfocus.com>

<http://www.publicnow.com>

<http://www.therolladailynews.com>

<https://www.naturalnews.com>

<https://smartwatermagazine.com>

<https://phys.org/news/2020>

<https://www.nanowerk.com/nanotechnology>

etc.

Grants awarded

16. October 1, 2023 – September 30, 2027: **National Science Foundation** Award # 2324158
“Collaborative Research: DMREF: Computationally Driven Discovery and Synthesis of 2D Materials through Selective Etching” \$465,916 (PI)
15. September 1, 2019 - August 31, 2022: **National Science Foundation** Award # 1930881 “Atomic-Layer Dependent Adhesion of Two-Dimensional Transitional Metal Carbides (MXenes)” \$407,962 (Co-PI)
14. August 1, 2019 - July 31, 2022: **National Institute of Health National Eye Institute** Award #0058619
“Enhancing ocular uptake of thiol antioxidants with nanodiamonds” \$387,500 (Co-PI)
13. July 1, 2019 - June 31, 2021: **Missouri S&T Office of Research** “New Biomedical Research Core Facility: The Bio-CURE Lab at Missouri S&T” \$400,000 (Co-PI)
12. October 1, 2018 - September 30, 2021: **DAICEL Corp. (Japan)** “Characterization, purification, chemical modification and development of nanodiamond particles (ND) for ND-polymer composites” \$210,120 (PI)
11. June 15, 2018 - June 14, 2021: **Army Research Office** Award # 0055437 “Detonation Synthesis of Nanomaterials” \$381,000 (Co-PI)
10. October 21, 2016 - September 30, 2018: **DAICEL Corp. (Japan)** “Characterization, purification, chemical modification of nanodiamond particles (ND) for improved dispersion in aqueous and non-aqueous systems, and subsequent development, manufacturing, and testing of ND based composites” \$200,133 (PI)
9. November 1, 2015 - July 31, 2016: **US Army Research Laboratory** Proposal #W911NF-17-1-0001
“Detonation Synthesis of Nanomaterials” \$50,000 (Co-PI)
8. January 16, 2015 - June 30, 2015: **National Science Foundation** RAPID Proposal #1518999
“Hierarchical Carbon Adsorbent for Cytokines Removal from Blood of the Ebola Virus Disease Patients” \$100,000 (PI)
7. June 2012: Drexel - Shanghai Advanced Research Institute Center “Nanodiamond Platforms for Anticancer Chemotherapeutics Delivery in Brain” \$117,000 (FY2013) (Co-PI)
6. July 1, 2010: **NSF** proposal #CBET-0959361 “MRI-R2: Acquisition of an X-ray Photoelectron Spectroscopy (XPS) Surface Analysis Instrumentation for Enabling Research and Education in Greater Philadelphia” \$1,125,000 (Co-PI)
5. August, 2009 - July, 2012: **NSF** Proposal #0927963 “GOALI/Collaborative Research: Functionalized Nanodiamond Reinforced Biopolymers for Microporous Surgical Fixation Devices.” \$568,090 (Co-PI)
4. October 1, 2007 - June 30, 2008 Proof of Concept Fund by Nanotechnology Institute / Ben Franklin Technology Partners of Southeastern Pennsylvania “Incorporation of Functionalized Nanodiamond into the Polymeric Structure of Epoxy Systems” (Project Leader)

3. December 1, 2006 - June 30, 2007: Nanotechnology Applications Fund by Nanotechnology Institute / Ben Franklin Technology Partners of Southeastern Pennsylvania “*Nanodiamond for Drug Delivery, Biomedical Imaging and Decreasing Blood Cholesterol*” (Project Leader)
2. May 1, 2005 - December 31, 2005: Nanotechnology Applications Fund R&D Proposal by Nanotechnology Institute / Ben Franklin Technology Partners of Southeastern Pennsylvania “*Surface Modification of Nanodiamond for Biomedical Applications*” (Project Leader)
1. September 2005 - May 2006: Ben Franklin Technology Partners of Southeastern Pennsylvania “*Surface Modification of Nanodiamond*” (Project Leader)

User facilities and other grants awarded

5. April 26, 2019 Argonne National Laboratory, Center for Nanoscale Materials, proposal # CNM 64421 “*Tribology of 2D Transition Metal Carbides (MXenes)*” (PI)
4. January 7, 2015: Oak Ridge National Laboratory, Neutron Sciences, Neutron Sciences, Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA), proposal # IPTS-12866.1 “*Combined Inelastic Neutron Scattering and Theoretical Study of Vibrational Density of States of MXenes*” (PI)
3. November 12, 2012: Oak Ridge National Laboratory, Neutron Sciences, Extended Q-Range Small-Angle Neutron Scattering (EQSANS), proposal # IPTS-8350 “*Structure Determination of Intercalated MXene*” (PI)
2. November 12, 2012: Oak Ridge National Laboratory, Neutron Sciences, Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA), proposal # IPTS-8289 “*Study of MXene and MXene Intercalation Compounds by Inelastic Neutron Scattering*” (PI)
1. April 29, 2011: Oak Ridge National Laboratory, Neutron Sciences, Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA), proposal # IPTS-4917 “*Neutron Spectroscopy of Nanodiamonds*” (PI)

Peer reviewed journal publications (submitted, accepted or published; three additional papers currently in preparation)

96. A. Baimenov, C. Daulbayev, S. G. Pouloupoulos, V. N. Mochalin, *MXene Filled Hydrogel and Aerogel Composites*, **Materials Today**, **78**, 79-91 (2024)
95. M. A. K. Purbayanto, D. Bury, M. Chandel, Z. Dehghan Shahrak, V. N. Mochalin, A. Wójcik, D. Moszczyńska, A. Wojciechowska, A. Tabassum, M. Naguib, A. M. Jastrzębska, *Ambient Processed rGO/Ti3CNTx MXene Thin Film with High Oxidation Stability, Photosensitivity, and Self-Cleaning Potential*, **ACS Applied Materials & Interfaces**, **15** (37), 44075-44086 (2023)
94. M. Beidaghi, S. Huang, V. N. Mochalin, *Properties and Applications of Two-Dimensional MXenes*, **Diamond and Related Materials**, **139**, 110255 (2023)
93. I. C. Kuschnerus, H. Wen, X. Zeng, Y. Y. Khine, J. Ruan, C.-J. Su, U.-S. Jeng, H. A. Girard, J.-C. Arnault, E. Ōsawa, O. Shenderova, V. N. Mochalin, M. Liu, M. Nishikawa, S. L.Y. Chang, *Fabrication Process Independent and Robust Aggregation of Detonation Nanodiamonds in Aqueous Media*, **Diamond and Related Materials**, **139**, 110199 (2023)
92. A. Rosenkranz, M. C. Righi, A. V. Sumant, B. Anasori, V. N. Mochalin, *Perspectives of 2D MXene Tribology*, **Advanced Materials**, 2207757 (2023) (perspective article <https://doi.org/10.1002/adma.202207757>)
91. S. Huang, V. Natu, J. Tao, Y. Xia, V. N. Mochalin, M. W. Barsoum, *Understanding the Effect of Sodium Polyphosphate on Improving Chemical Stability of Ti₃C₂T₂ MXene in Water*, **Journal of Materials Chemistry A**, **10** (41), p. 22016-22024 (2022)
90. S. Huang, V. N. Mochalin *Combination of High pH and an Antioxidant Improves Chemical Stability of Two-Dimensional Transition-Metal Carbides and Carbonitrides (MXenes) in Aqueous Colloidal*

- Solutions*, **Inorganic Chemistry**, **61** (26), p. 9877-9887 (2022)
(<https://www.azonano.com/news.aspx?newsID=39308>)
89. S. L. Y. Chang, P. Reineck, A. Krueger, V. N. Mochalin *Ultrasmall Nanodiamonds: Perspectives and Questions*, **ACS Nano**, **16** (6), p. 8513-8524 (2022) (perspective article)
 88. Y. Li, S. Huang, C. Wei, D. Zhou, B. Li, V. N. Mochalin, C. Wu *Friction Between MXenes and Other Two-Dimensional Materials at the Nanoscale*, **Carbon**, **196**, p. 774-782 (2022)
 87. Y. Li, C. Wei, S. Huang, A. Ghasemi, W. Gao, C. Wu, V. N. Mochalin *In Situ Tensile Testing of Nanometer-Thick Two-Dimensional Transition-Metal Carbide Films: Implications for MXenes Acting as Nanoscale Reinforcement Agents*, **ACS Applied Nanomaterials**, **4** (5), p. 5058-5067 (2021)
 86. S. Huang, K. Mutyala, A. Sumant, V. N. Mochalin *Achieving Superlubricity with 2D Transition Metal Carbides (MXenes) and MXene/Graphene Coatings*, **Materials Today Advances**, **9**, Article # 100133 (2021)
 85. Y. Li, S. Huang, C. Wei, D. Zhou, B. Li, C. Wu, V. N. Mochalin *Adhesion Between MXenes and Other 2D Materials*, **ACS Applied Materials & Interfaces**, **13** (3), p. 4682-4691 (2021)
 84. Y. Li, C. Wei, S. Huang, C. Wu, V. N. Mochalin *In-situ SEM compression of accordion-like multilayer MXenes*, **Extreme Mechanics Letters**, **41**, Article # 101054 (2020)
 83. S. Huang, V. N. Mochalin *Understanding Chemistry of Two-Dimensional Transition Metal Carbides and Carbonitrides (MXenes) with Gas Analysis*, **ACS Nano**, **14** (8), p. 10251-10257 (2020) (covered at <https://www.nanowerk.com/nanotechnology-news2/newsid=55699.php>)
 82. J. Yi, J. Li, S. Huang, L. Hu, L. Miao, C. Zhao, S. Wen, V. N. Mochalin, A. M. Rao *Ti₂CT_x MXene-based all-optical modulator*, **InfoMat**, **2** (3), p.601-609 (2020)
 81. I. M. Abdullahi, M. Langenderfer, O. Shenderova, N. Nunn, M. D. Torelli, C. Johnson, V. N. Mochalin *Explosive Fragmentation of Luminescent Diamond Particles*, **Carbon**, **164**, p. 442-450 (2020)
 80. M. J. Langenderfer, W. G. Fahrenholtz, S. Chertopalov, Y. Zhou, V. N. Mochalin, C. E. Johnson *Detonation Synthesis of Silicon Carbide Nanoparticles*, **Ceramics International**, **46** (5), p.6951-6954 (2020)
 79. G. Thalassinou, A. Stacey, N. Dontschuk, B. J. Murdoch, E. Mayes, H. A. Girard, I. M. Abdullahi, L. Thomsen, A. Tadich, J.-C. Arnault, V. N. Mochalin, B. C. Gibson, P. Reineck *Fluorescence and Physico-Chemical Properties of Hydrogenated Detonation Nanodiamonds*, **C-Journal of Carbon Research**, **6** (1), Article # 7 (2020)
 78. A. Kume, V. N. Mochalin *Sonication-Assisted Hydrolysis of Ozone Oxidized Detonation Nanodiamond*, **Diamond and Related Materials**, **103**, Article # 107705 (2020)
 77. G. Li, N. Amer, H. A. Hafez, S. Huang, D. Turchinovich, V. N. Mochalin, F. A. Hegmann, L. V. Titova *Dynamical Control over Terahertz Electromagnetic Interference Shielding with 2D Ti₃C₂T_y MXene by Ultrafast Optical Pulses*, **Nano Letters**, **20** (1), p.636-643 (2019)
 76. J. Beltz, A. Pfaff, I. M. Abdullahi, A. Cristea, V. N. Mochalin, N. Ercal *Effect of Nanodiamond Surface Chemistry on Adsorption and Release of Tiopronin*, **Diamond and Related Materials**, **100**, Article # 10759 (2019)
 75. J. Yi, L. Du, J. Li, L. Yang, L. Hu, S. Huang, Y. Dong, L. Miao, S. Wen, V. N. Mochalin, C. Zhao, A. M. Rao *Unleashing the Potential of Ti₂CT_x MXene as a Pulse Modulator for Mid-Infrared Fiber Lasers*, **2D Materials**, **6** (4), Article # 045038 (2019)
 74. Y. Li, S. Huang, C. Wei, C. Wu, V. N. Mochalin *Adhesion of Two-Dimensional Titanium Carbides (MXenes) and Graphene to Silicon*, **Nature Communications**, **10** (1), Article # 3014 (2019)
 73. S. Huang, V. N. Mochalin *Hydrolysis of 2D Transition-Metal Carbides (MXenes) in Colloidal Solutions* **Inorganic Chemistry**, **58** (3), p.1958-1966 (2019) (cited 114 times
<https://scholar.google.com/scholar?oi=bibs&hl=en&cites=4505563154437259499>, covered at
<https://phys.org/news/2019-01-d-transition-metal-carbides-react.html>)

72. V Borysiuk, V. N. Mochalin *Thermal Stability of Two-Dimensional Titanium Carbides $Ti_{n+1}C_n$ (MXenes) from Classical Molecular Dynamics Simulations*, **MRS Communications**, **9** (1), p.203-208 (2019)
71. M. Seredych, B. Haines, V. Sokolova, P. Cheung, F. Meng, L. Stone, L. Mikhalovska, S. Mikhalovsky, V. N. Mochalin, Y. Gogotsi *Graphene-Based Materials for the Fast Removal of Cytokines from Blood Plasma*, **ACS Applied Bio Materials**, **1** (2), p.436-443 (2018)
70. G. Li, K. Kushnir, Y. Dong, S. Chertopalov, A.M. Rao, V. Mochalin, R. Podila, L. Titova *Equilibrium and Non-Equilibrium Free Carrier Dynamics in Two-Dimensional $Ti_3C_2T_x$ MXenes: THz spectroscopy study*, **2D Materials**, **5** (3), Article # 035043 (2018)
69. S. Chertopalov, V. N. Mochalin *Environment Sensitive Photoresponse of Spontaneously Partially Oxidized $Ti_3C_2T_x$ MXene Thin Films*, **ACS Nano**, **12** (6), p.6109-6116 (2018) (cited 103 times <https://scholar.google.com/scholar?oi=bibs&hl=en&cites=2466230494559114087>, covered at <https://www.azonano.com/news.aspx?newsID=36225>)
68. Y. Zheng, N. Pescatore, Y. Gogotsi, B. Dyatkin, G. Ingavle, V. Mochalin, T. Ozulumba, S. Mikhalovsky, S. Sandeman *Rapid Adsorption of Pro-inflammatory Cytokines by Graphene Nanoplatelets and Their Composites for Extracorporeal Detoxification*, **Journal of Nanomaterials**, Article ID 6274072, 8 pages (2018)
67. Y. Dong, S. Chertopalov, K. Maleski, B. Anasori, L. Hu, S. Bhattacharya, A. M. Rao, Y. Gogotsi, V. N. Mochalin, R. Podila *Saturable Absorption in 2D Ti_3C_2 MXene Thin Films for Passive Photonic Diodes*, **Advanced Materials**, 1705714, <https://doi.org/10.1002/adma.201705714> (2018)
66. Y. Dong, S. S. K. Mallineni, K. Maleski, H. Behlow, V. N. Mochalin, A. M. Rao, Y. Gogotsi, R. Podila *Metallic MXenes: A New Family of Materials for Flexible Triboelectric Nanogenerators*, **Nano Energy**, **44**, p.103-110 (2018)
65. V. N. Borysiuk, V. N. Mochalin, Y. Gogotsi *Bending Rigidity of Two-Dimensional Titanium Carbide (MXene) Nanoribbons: A Molecular Dynamics Study*, **Computational Materials Science**, **143**, p.418-424 (2018)
64. P. Reineck, D. W. M. Lau, E. R. Wilson, K. Fox, M. R. Field, C. Deelepojananan, V. N. Mochalin, B. C. Gibson *Effect of Surface Chemistry on the Fluorescence of Detonation Nanodiamonds*, **ACS Nano**, **11** (11), p.10924-10934 (2017)
63. K. Turcheniuk, V. N. Mochalin *Biomedical Applications of Nanodiamond (Review)*, **Nanotechnology**, **28** (25), article #252001 (27pp) (2017) (highlighted topical review <http://iopscience.iop.org/journal/0957-4484/page/Highlights%202017>, cited 201 times)
62. K. Maleski, V. N. Mochalin, Y. Gogotsi *Dispersions of Two-Dimensional Titanium Carbide MXene in Organic Solvents*, **Chemistry of Materials**, **29** (4), p.1632-1640 (2017)
61. M. Ghidui, S. Kota, J. Halim, A. W. Sherwood, N. Nedfors, J. Rosen, V. N. Mochalin, M. W. Barsoum *Alkylammonium Cation Intercalation into Ti_3C_2 (MXene): Effects on Properties and Ion-Exchange Capacity Estimation*, **Chemistry of Materials**, **29** (3), p.1099-1106 (2017)
60. K. Turcheniuk, C. Trecuzzi, C. Deelepojananan, V. N. Mochalin *Salt-Assisted Ultrasonic Deaggregation of Nanodiamond*, **ACS Applied Materials & Interfaces**, **8** (38), p.25461-25468 (2016)
59. K. Turcheniuk, V. N. Mochalin *Adsorption Behavior and Reduction of Copper (II) Acetate on the Surface of Detonation Nanodiamond with Well Defined Surface Chemistry*, **Carbon**, **109**, p.98-105 (2016)
58. M. Zeiger, N. Jäckel, V. N. Mochalin, V. Presser *Carbon Onions for Electrochemical Energy Storage (Review)*, **Journal of Materials Chemistry A**, **4**, 3172-3196 (2016)
57. J. Giammarco, V. N. Mochalin, J. Haeckel, Y. Gogotsi *The adsorption of Tetracycline and Vancomycin onto Nanodiamond with Controlled Release*, **Journal of Colloid & Interface Science**, **468**, 253-261 (2016)

56. M. Setyawati, V. N. Mochalin, D. Leong *Tuning Endothelial Permeability with Functionalized Nanodiamonds*, **ACS Nano**, **10**, 1170-1181 (2015)
55. W. Lei, V. N. Mochalin, D. Liu, S. Qin, Y. Gogotsi, Y. Chen *Boron Nitride Colloidal Solutions, Ultralight Aerogels and Freestanding Membranes through One-step Exfoliation and Functionalization*, **Nature Communications**, **6**, article #8849 (8pp) (2015) (covered at <http://phys.org/news/2015-11-scientists-revolutionary-material-oil.html>)
54. V. N. Mochalin, Y. Gogotsi *Nanodiamond-Polymer Composites (Invited Thematic Article)*, **Diamond & Related Materials**, **58**, p.161-171 (2015)
53. V. N. Borysiuk, V. N. Mochalin, Y. Gogotsi *Molecular Dynamic Study of the Mechanical Properties of Two-Dimensional Titanium Carbides $Ti_{n+1}C_n$ (MXenes)*, **Nanotechnology**, **26**, 265705 (10pp) (2015) (covered at <http://nanotechweb.org/cws/article/lab/61514>)
52. A. M. Knapinska, D. Tokmina-Roszyk, S. Amar, M. Tokmina-Roszyk, V. N. Mochalin, Y. Gogotsi, P. Cosme, A. C. Terentis, G. B. Fields *Solid-Phase Synthesis, Characterization, and Cellular Activities of Collagen-Model Nanodiamond-Peptide Conjugates*, **Biopolymers (Peptide Science)**, **104** (3), p.186-195 (2015) (**Featured on cover page**)
51. G. C. C. Costa, O. Shenderova, V. Mochalin, Y. Gogotsi, A. Navrotsky *Thermochemistry of Nanodiamond Terminated by Oxygen Containing Functional Groups*, **Carbon**, **80**, p.544-550 (2014)
50. O. Mashtalir, K. M. Cook, V. N. Mochalin, M. Crowe, M. W. Barsoum, Y. Gogotsi *Dye Adsorption and Decomposition on Two-Dimensional Titanium Carbide in Aqueous Media*, **Journal of Materials Chemistry A**, **2** (35), p.14334-14338 (2014)
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Talks, seminars, and conference presentations

78. V. N. Mochalin *MXene Chemistry and Applications (Invited Talk)*, Fall 2024 European Materials Research Society Meeting, September 16-19, 2024, Warsaw, Poland (<https://emrs-2024-fall-meeting.key4.live/programme-live-1>)
77. V. N. Mochalin *Reactivity of 2D Transition Metal Carbides (MXenes) (Invited Talk)*, MXenes: Changing the World, the 3rd International MXene Conference at Drexel University, August 5-7, 2024, Philadelphia, Pennsylvania, USA (<https://mxeneconference.coe.drexel.edu/speakers-panelists/>)
76. V. N. Mochalin *MXene Chemistry and Applications (Invited Talk)*, 2023 Materials Research Society Fall Meeting, 26 Nov - 1 Dec 2023, Boston, Massachusetts, USA (https://www.mrs.org/meetings-events/fall-meetings-exhibits/2023-mrs-fall-meeting/call-for-papers/detail/2023_mrs_fall_meeting/el17/Symposium_EL17)
75. V. N. Mochalin *Chemistry of 2D Transition Metal Carbides and Carbonitrides (MXenes)*, 16th New Diamond & Nanocarbons 2023, June 18-22, 2023, East Lansing, Michigan, USA
74. V. N. Mochalin *Nanodiamonds and MXenes (Fundamentals and Applications) (Invited Seminar)*, University of the Western Cape, May-3, 2023, Cape Town, South Africa
73. V. N. Mochalin *MXene Chemistry: Fundamentals and Applications (Invited Talk)*, 2022 Materials Research Society Fall Meeting, 27 Nov - 2 Dec 2022, Boston, Massachusetts, USA (https://www.mrs.org/meetings-events/fall-meetings-exhibits/2022-mrs-fall-meeting/symposium-sessions/presentations/detail/2022_mrs_fall_meeting/3780725-202211290415)
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71. V. N. Mochalin *MXene Chemistry: Fundamentals and Applications (Invited Talk)*, 15th International Ceramics Congress (CIMTEC), 20-24 Jun 2022, Perugia, Italy (<http://2022.cimtec-congress.org/>)
70. V. N. Mochalin *Chemistry of 2D Transition Metal Carbides and Nitrides (MXenes) (Invited Talk)*, 2022 Materials Research Society Spring Meeting, 8-13 May 2022, Honolulu, Hawaii, USA (<https://www.mrs.org/meetings-events/spring-meetings-exhibits/past-spring-meetings/2022-mrs-spring-meeting>)

69. V. N. Mochalin *Chemistry of Transition Metal Carbides: from Bulk to Nanoscale (Invited Talk)*, 31st International Conference on Diamond and Carbon Materials, 6-9 Sep 2021, online: live and on-demand (<https://www.elsevier.com/events/conferences/international-conference-on-diamond-and-carbon-materials/programme/speakers>)
68. V. N. Mochalin *2,1,0... Chemist's Adventures in Nanomaterials Wonderland (Invited Talk)* 2021 Fall American Chemical Society Meeting, 22-26 Aug-2021 Atlanta, GA, USA
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66. V. N. Mochalin *MXene Chemistry for Applications (Invited Talk)*, MXene 2020: Ten Years Later, 3-7 Aug (2020), Drexel University, Philadelphia, USA (<https://mxeneconference.coe.drexel.edu/mxene-conference-2020/program/invited-speakers/>)
65. V. N. Mochalin *Progress in Nanodiamonds for Novel Composites and Biomedical Applications (Invited Lecture)*, Virtual Lecture Series on Nanodiamond, 28 May 2020, <https://www.adamasnano.com/virtual-lecture-series-on-nanodiamond/>
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52. V. Mochalin, V. Borysiuk, Y. Gogotsi, *Mechanical Properties of MXenes from In Silico Experiments*, 2018 Materials Research Society Spring Meeting, 2-6 Apr 2018, Phoenix, AR, USA
51. V. Mochalin *Modeling of Nanodiamond in Water*, 2018 Materials Research Society Spring Meeting, 2-6 Apr 2018, Phoenix, AR, USA
50. V. Mochalin *Salt-Assisted Ultrasonic Deaggregation of Nanodiamonds (SAUD)*, 28th International Conference on Diamond and Carbon Materials, 3-7 Sep 2017, Göthenburg, Sweden
49. V. Mochalin *MXenes for Energy Generation and Optical Applications (Invited Talk)*, Nanotechnology and Nanomaterials (NANO-2017) at Y. Fedkovych National University, 23-26 Aug 2017, Chernivtsi, Ukraine
48. V. Mochalin *Nanodiamond and MXenes – Nanomaterials for Composites, Biomedical, and Energy Applications (Invited Lecture)*, 4th International Summer School Nanotechnology: from fundamental research to innovations, 19-22 Aug 2017, Migovo, Ukraine
47. V. Mochalin *Detonation Nanodiamond: Synthesis, Deaggregation, Modification, Applications*, 20th Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter, 9-14 Jul 2017 St Louis, MO, USA
46. V. N. Mochalin, Y. Gogotsi *Biomedical Applications of Diamond Nanoparticles (Invited Talk)*, 227th Electrochemical Society Meeting, 24 - 28 May 2015, Chicago, IL, USA
45. V. N. Mochalin *Onion-Like Nanocarbons and MXenes for Electrochemical Energy Storage Applications (Invited Lecture)*, 16th Topical Meeting of the International Society of Electrochemistry, 22-26 Mar 2015, Angra dos Reis, Brazil
44. V. N. Mochalin *2,1,0: Chemist's Adventures in Nanomaterials Wonderland (Invited Seminar)*, Missouri University of Science and Technology, 3 Feb 2015, Rolla, Missouri
43. V. N. Mochalin *Novel Nanomaterials for Energy and Biomedical Applications (Invited Seminar)*, Ulsan National Institute of Science and Technology, 27 Aug 2014, Ulsan, South Korea
42. V. N. Mochalin *Nanodiamond for Advanced Composites (Invited Talk)*, Nanotech 2014, 15-19 Jun 2014, Washington, DC
41. V. N. Mochalin *Atomistic Modeling of Nanodiamond Solvation*, New Diamond and Nano Carbons, 25 - 29 May 2014, Chicago, IL
40. V. N. Mochalin, Y. Gogotsi *Modification of Nanodiamond for Improved Performance (Invited Talk)*, New Diamond and Nano Carbons, 25 - 29 May 2014, Chicago, IL
39. V. N. Mochalin *Atomistic Modeling of Nanodiamond Solvation in Water*, Materials Research Society Meeting, 20 - 25 Apr 2014, San Francisco, CA, USA
38. V. N. Mochalin *Biomedical Applications of Diamond Nanoparticles: from Biodegradable Composites to Drug Delivery (Invited Seminar)*, Temple University, 28 Feb 2014, Philadelphia, PA
37. V. N. Mochalin *MXene: A New Family of Two-Dimensional Materials (Invited Seminar)*, Florida International University, 21 Feb 2014, Miami, FL
36. V. N. Mochalin *Characterization, Chemistry, and Applications of Nanodiamond (Invited Talk)*, Schulich Workshop Physicochemical and Electronic Properties of Nanodiamond Films and Particles, Department of Chemistry, Technion (Israel Institute of Technology), 21 - 22 Jan 2014, Haifa, Israel
35. V. N. Mochalin *Novel Nanomaterials for Energy and Biomedical Applications (Invited Seminar)* Department of Materials Science and Engineering, Technion (Israel Institute of Technology), 16 Jan 2014, Haifa, Israel
34. V. N. Mochalin *Nanodiamond for Biomedical Applications and Advanced Composites (Invited Seminar)*, Florida International University, 15 Nov 2013, Miami, FL

33. V. N. Mochalin *Nanodiamond for Biomedical Applications and Advanced Composites (Invited Lecture)*, International Conference on Diamond and Carbon Materials 2013, 2 - 5 Sep 2013, Riva del Garda, Italy (**highlighted as #1 high profile speaker in the conference webcast**)
32. V. N. Mochalin *Nanodiamond Particles: Emerging Biomedical Applications (Invited Seminar)*, Nanoscience Technology Center, University of Central Florida, 25 Apr 2013, Orlando, FL
31. V. N. Mochalin, A. Pentecost, Y. Gogotsi *Adsorption of Drugs on Nanodiamond: Towards Development of a Drug Delivery Platform*, Materials Research Society Meeting, 1 - 5 Apr 2013, San Francisco, CA, USA
30. V. N. Mochalin *Detonation Nanodiamond: Synthesis, Properties, and Applications*, Materials Research Society Meeting, 1 - 5 Apr 2013, San Francisco, CA, USA
29. V. N. Mochalin *Carbon Containing Nanomaterials for Energy, Composites and Biomedical Applications (Invited Seminar)*, Carnegie Institution of Washington, Washington DC, 21 Nov 2012
28. I. Neitzel, B. Etzold, F. Strobl, V. Mochalin, Y. Gogotsi *Controlling Nanodiamond Surface Functionalization by a Layer-by-layer Approach*, International Conference on Diamond and Related Materials, 3 - 6 Sep 2012, Granada, Spain
27. I. Neitzel, V. Mochalin, A. Kontsos, G. Palmese, Y. Gogotsi *Nanodiamonds with Optimized Surface Chemistry for Polymer Composites*, International Conference on Diamond and Related Materials, 3 - 6 Sep 2012, Granada, Spain
26. V. N. Mochalin, I. Neitzel, Q. Zhang, A. Pentecost, M. Nelson, Y. Gogotsi *Surface Modification of Nanodiamond for Biomedical and Composite Applications*, 244th American Chemical Society Meeting, 19 - 23 Aug 2012, Philadelphia PA, USA
25. V. N. Mochalin, I. Neitzel, Y. Gogotsi *Covalent Incorporation of Nanodiamond into Epoxy Polymers*, 244th American Chemical Society Meeting, 19 - 23 Aug 2012, Philadelphia PA, USA
24. V. Mochalin *Nanodiamond and Carbon Nanoions: Synthesis, Properties, and Interrelations (Invited Lecture)*, Dalian University of Technology, 16 July 2012, Dalian, China (<http://finechem.dlut.edu.cn/carbon/news/recent%20news/news20120716.html>)
23. V. Mochalin *Advances in Nanodiamond for (Bio)Composite Applications (Invited Seminar)*, Shanghai Jiao Tong University, 10 July 2012, Shanghai, China
22. V. Mochalin *Surface modification of Nanodiamond for Biomedical and Composite Applications (Invited Seminar)*, Shanghai Advanced Research Institute, Chinese Academy of Sciences, 6 July 2012, Shanghai, China
21. V. Mochalin, I. Neitzel *Advances in Nanodiamond for (Bio)Composite Applications (Invited Presentation)*, 2012 MRS Spring Meeting, 9 - 13 Apr 2012, San Francisco CA, USA
20. V. Mochalin, I. Neitzel, Q. Zhang, J. Zhou, P. Lelkes, Y. Gogotsi *Nanodiamond for Advanced Polymer-Matrix Composites*, 2011 MRS Fall Meeting, 28 Nov - 2 Dec 2011, Boston MA, USA
19. V. Mochalin *Purification and Modification of Nanodiamond and Carbon Onions for Electrochemical Applications*, 220th Electrochemical Society Meeting, 9 - 14 Oct 2011, Boston, MA, USA
18. V. Mochalin *Nanodiamond - Material of the Future (Invited Seminar)* Alfred University, February 17-18 2011, NY
17. V. Mochalin *Nanodiamond: An Old and Unfamiliar Member of the Nanocarbons Family (Invited Seminar)* Ben-Gurion University of the Negev, 27 Apr 2010, Sde Boker, Israel
16. V. N. Mochalin, I. Neitzel, Q. Zhang, J. Zhou, C. A. Klug, Y. Gogotsi *Surface Functionalization of Nanodiamond for Composite and Biomedical Applications*, Materials Research Society Meeting, 29 Nov - 4 Dec 2009, Boston, MA, USA
15. V. Mochalin *Nanodiamond-Polymer Composites (Invited Lecture)* AATCC Symposium: Innovations in Functional Materials, Sports & Defense Technologies, & Composites Symposium & NTC Forum, 26 - 27 Oct 2009, Greenville, SC USA

14. V. Mochalin, I. Neitzel, Q. Zhang, A. Pentecost, I. Knoke, J. Zhou, Y. Gogotsi *Surface Modification of Nanodiamond for Biomedical Applications*, Nanobiophysics: Fundamental and Applied Aspects, 5 - 8 Oct 2009, B.Verkin Institute for Low Temperature Physics and Engineering of the NAS of Ukraine, Kharkov, Ukraine
13. V. Mochalin, J. Giammarco, A. Gurga, J. Detweiler, C. Hobson, Y. Gogotsi, M. Sullivan, A. Peterson, G. Palmese *Aminated Nanodiamond Powder as a Novel Material for Advanced Composites*, 236th American Chemical Society National Meeting, 17 - 23 Aug 2008, Philadelphia, PA USA
12. A. Stravato, K. Behler, V. Mochalin, G. Korneva, Y. Gogotsi *Electrospun Nanodiamonds-Polymer Composite Fibers and Coatings*, 236th American Chemical Society National Meeting, 17 - 23 Aug 2008, Philadelphia, PA USA
11. V. Mochalin, K. Behler, A. Stravato, J. Giammarco, S. Osswald, Y. Gogotsi *Surface Modification of Nanodiamond Powders for Advanced Composites and Biomedical Applications*, NanoDiamond'2008, 1 - 4 Jul 2008, St.Petersburg, Russia
10. V. Mochalin, S. Osswald, C. Portet, M. Havel, G. Yushin, C. Hobson, Y. Gogotsi *Nanodiamond Powders: Oxidation, Surface Functionalization and Phonon Confinement (Invited Presentation)*, Materials Research Society 2007 Fall Meeting, 26 - 30 Nov 2007, Boston, MA USA
9. Y. Gogotsi, V. Mochalin, S. Osswald, G. Yushin, B. Legum *Surface Modification of Nanodiamond (Invited Presentation)*, Diamond 2007, 9 - 14 Sep 2007, Berlin, Germany
8. V. Mochalin, S. Osswald, G. Yushin, S. Kucheyev, K. Behler, Y. Gogotsi *Characterization and Surface Modification of Nanodiamond*, 231st ACS National Meeting, 26 - 30 Mar 2006, Atlanta, GA USA
7. A. P. Yaroshenko, M.V. Savoskin, V. N. Mochalin, N. I. Lazareva, R. D. Mysyk *Using graphite intercalation compounds for producing exfoliated graphite - amorphous carbon - TiO₂ composites*, 13th International Symposium on Intercalation Compounds, 6 - 9 Jun 2005, Clermont - Ferrand, France. Symposium Proceeding. Blaise Pascal University, 2005. - P.54
6. A. P. Yaroshenko, M. V. Savoskin, V. N. Mochalin, N. I. Lazareva, R. D. Mysyk *Using graphite intercalation compounds for producing carbon - carbon composites*, 13th International Symposium on Intercalation Compounds, 6 - 9 Jun 2005, Clermont - Ferrand, France. Symposium Proceeding. Blaise Pascal University, 2005, P.34
5. M. V. Savoskin, A. P. Yaroshenko, V. N. Mochalin, N. I. Lazareva, T. E. Konstantinova *Intercalation as a Way to Carbon Nanoscrolls and Carbon - Carbon Composites*, NATO - CARWC "New Carbon Based Materials for Electrochemical Energy Storage Systems", 17 - 24 Oct 2003, Argonne National Laboratory, p.39
4. M. V. Savoskin, A. P. Yaroshenko, V. N. Mochalin, B. V. Panchenko, S. B. Lyubchik *Sorption of industrial oil by expanded graphite*, Proc. 3rd Int. Conf. "Oil Pollution: Prevention, Characterization, Clean Technology", Vol. I, p. 156-161, 8 - 11 Oct 2002, Gdansk, Poland
3. A. I. Lutsyk, E. S. Rudakov, V. N. Mochalin *A new Calculation Method for Arenes Solubilities in the Whole Composition Range of Water - Sulfuric Acid System*, DGMK-Conference "The Future Role of Aromatics in Refining and Petrochemistry", p.201-205, 1999, Erlangen, Germany
2. A. I. Lutsyk, V. N. Mochalin, V. V. Zamaschikov *Accounting Media Effects in the Reaction of Isobutene Hydration*, 16th International Congress on the General and Applied Chemistry, Russia, Moscow, 1998, p.190-191
1. O. I. Lutsyk, V. M. Mochalin *Accounting Media Effects in the Reaction of Isobutene Hydration*, 6th Scientific Conference "L'vivski khimichni chitannya-97" ("Lviv's Proceedings in Chemistry-97"), Ukraine, Lviv, 1997, p.85