

CURRICULUM VITA

MICHEL W. BARSOUM

PERSONAL

Date of Birth: January 1, 1955
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EDUCATION

Ph.D. MASSACHUSETTS INSTITUTE OF TECHNOLOGY, June 1985
Degree in Ceramics from Department of Materials Science and Engineering

M.Sc. UNIVERSITY OF MISSOURI-ROLLA, ROLLA, MO. June 1980
Degree in Ceramics Engineering, Department of Ceramic Engineering

B.Sc. AMERICAN UNIVERSITY IN CAIRO, CAIRO, EGYPT Feb. 1977
Department of Materials Engineering; Highest honors.

PROFESSIONAL EXPERIENCE

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1999-present
Distinguished Professor, Department of Materials Science and Engineering

LINKOPING UNIVERSITY, Linkoping, Sweden Oct. 08-present
Visiting Professor

INSTITUT POLYTECHNIQUE DE GRENOBLE, Grenoble, France Jan.–Mar. 2016
Sabbatical leave.

IMPERIAL COLLEGE, London, UK Sept.–Dec. 2015
Sabbatical leave as Leverhulme Trust scholar.

NINGBO INSTIT. OF MATERIALS TECHNOLOGY, Ningbo, China Sept. 2013-2014
Visiting Professor

DREXEL UNIVERSITY, Philadelphia, PA. Jan. 2009-2013
A. W. Grosvenor Professor, Department of Materials Science and Engineering

LOS ALAMOS NATIONAL LABORATORY, Los Alamos, NM Oct. 08 – Sept. 09
Wheatly Scholar, Sabbatical Leave

COMMISSARIAT A L'ENERGIE ATOMIQUE, CEA, Saclay, France, Summer 2006

UNIVERSITY OF POITIERS, Poitiers, France, Summer 2003
Visiting Professor

MAX-PLANCK INSTITUTE, PML, Stuttgart, Germany Sept. 2000-2001
Sabbatical Leave

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1997-1999
Professor, Department of Materials Engineering

MAX-PLANCK INSTITUTE, FKF, Stuttgart, Germany Sept. 1993-94
Sabbatical Leave

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1985-99
Assistant and Associate Professor, Department of Materials Engineering

AWARDS (Highlighted entries are noteworthy)

International Ceramics Prize 2020, World Academy of Ceramics.
Provost Award for Outstanding Career Scholarly Achievement, Drexel U., 2019.
Highly Cited Researchers 2009 and 2018, 2019, Web of Science, ISI.
Outstanding Career Scholarly Research Achievement Award, College of Engin. Drexel U., 2017.
Foreign Member of the Royal Swedish Academy of Engineering Sciences, 2016.
Chair of Excellence, Nanosciences Foundation, Grenoble Alpes, Grenoble, France, 2016.
Elsevier Scopus, List of 300 most Cited Authors in Materials Science and Engineering, 2016.
www.msescupplies.com/blogs/news/2016-the-most-cited-researchers-in-materials-science-and-engineering-by-elsevier-scopus-data
ASM Delaware Valley Materials Person of the Year, 2016.
Visiting Professor, Grenoble Instit. of Tech. Grenoble, France; Winter, 2016.
Leverhulme Trust Visiting Professorship, Imperial College, London, UK; Fall 2015.
Outstanding Research Award, Dept. of Materials Science and Engin., Drexel Univ., 2013.
Visiting Professor, Ningbo Instit. Mater. Techn. & Engin., Chinese Acad. Science; 2013-2014
Ross Coffin Purdy Award 2013, American Ceramic Society. Given to authors who made the most valuable contribution to the ceramic technical literature published in 2012.
Visiting Professor, University of Poitiers, Poitiers, France; Feb. 2012.
Visiting Professor, Linkoping University, Linkoping, Sweden.
A. W. Grosvenor Professor, Department of Materials Science and Engineering, 2009-2014.
Wheatly Scholar, Los Alamos National Laboratory, Los Alamos, NM, October 2008.
2008 Sigma Xi Lecture, MIT, Cambridge, MA, May 2008.
Outstanding Research Award, Department of Materials Science and Engineering, 2008.
University Research/Scholarship Award, Drexel University, 2007 (Inaugural award).
Academician, World Academy of Ceramics, 2006.
Fellow, American Ceramic Society, 2005.
Marquis Who's Who in Science and Engineering, 2005-2006 Edition.
Outstanding Service Award, Department of Materials Science and Engineering, 2006.
Outstanding Teaching Award, Department of Materials Science and Engineering, 2005.
Outstanding Research Award, Department of Materials Science and Engineering, 2003.
Visiting Professorship, U. of Poitiers, Poitiers, France, 2003.
Outstanding Research Award, College of Engineering, Drexel University, 2003.
Research Scholar Award, Drexel University, 2001.
Alexander von Humboldt-Max Planck Society Prize for Senior US Scientists, 2000.
Distinguished Professor, Drexel University, 1999.

EDITORSHIPS AND EDITORIAL BOARD MEMEBERSHIPS

Editor: Materials Research Letters, Taylor and Francis.
Member of Editorial Boards: Results in Physics, Ceramics International and FlatChem.
Member of Advisory Boards: Journal of Advanced Ceramics.

BOOKS

M. W. Barsoum, Fundamentals of Ceramics, 2nd Ed., Taylor and Francis, London, 2020.
M. W. Barsoum, MAX Phases: Properties of Machinable Carbides and Nitrides, Wiley VCH GmbH & Co. 2013.
M. W. Barsoum, Fundamentals of Ceramics, Taylor and Francis, London, 2003.
M. W. Barsoum, Fundamentals of Ceramics, McGraw Hill, NY, 1997.

PATENTS:

- 1) M. W. Barsoum, "Methods for Densifying and Strengthening Ceramic-Ceramic Composites by Transient Plastic Phase Processing". Patent # 5,451,365 (1997).
- 2) M. W. Barsoum, D. Brodtkin, T. El-Raghy and G. S. Yaroschuk, "Synthesis of H-phase Products", WO 9727965, Issued in 1997.

- 3) M. W. Barsoum and T. El-Raghy, "Process for Making a Dense Ceramic Work-piece." Patent # 5,882,561. Issued in 1999.
- 4) M. W. Barsoum, T. El-Raghy, D. Brodtkin, A. Zavaliangos and S. Kalidindi, "Synthesis of 312 Compounds and Composites Thereof, Patent # 5,942,455. Issued in 1999.
- 5) M. W. Barsoum and T. El-Raghy, "Surface Modification of 312 and Related Materials", US Patent # 6,013,322. Issued in 2000.
- 6) R. Knight and M. W. Barsoum, "Corrosion, Oxidation, and/or Wear-Resistant Coatings", U.S. Patent No. 6,231,969. Issued May 2001.
- 7) T. El-Raghy, M. W. Barsoum, M. Sundberg and H. Pettersson, "Process for Forming 312 Phase Materials and Process for Sintering the Same", US Patent # 6,461,989. Issued October 2002.
- 8) M. Sundberg, K. Lindgren, T. El-Raghy and M. W. Barsoum, "Method of Producing a Metal-containing Single-phase Composition", US Patent # 6,986,873. January 2006.
- 9) V. Jovic and M. W. Barsoum, "Electrolytic Cell and Electrodes For Use in Electro-chemical Processes", US Patent 7,001,494. Issued Feb. 2006.
- 10) S. Gupta, M. W. Barsoum, C.-W. Li and T. G. Palanisamy, "Ternary Carbide and Nitride Materials Having Tribological Applications and Methods of Making Same". US Patent 7,553,564 B2. Issued June 2009.
- 11) T. G. Palanisamy, S. Gupta, M. W. Barsoum and C.-W. Li, "Ternary Carbide and Nitride Composites having Tribological Applications and Methods of Making Same". US Patent 7,572,313 B2. Issued August 2009.
- 12) S. Basu, P. Finkel, A. Zhou and M. W. Barsoum, "A Method for Structural Health Monitoring Using a Smart Sensor System". US Patent 7,917,311.
- 13) Y. Gogotsi and M. W. Barsoum, "Nanoporous Carbide Derived Carbon with Tunable Pore Size". Japanese Patent No. 4,646,911; US Patent 8,137,650, issued 3/20/2012.
- 14) M. W. Barsoum, Y. Gogotsi, M. Naguib and O. Mashtalir, "Compositions Comprising Free Standing Two Dimensional Nanocrystals", US Patent 9,193,595 issued 11/24/2015.
- 15) M. W. Barsoum, Y. Gogotsi, M. Naguib and O. Mashtalir, "Compositions Comprising Free Standing Two Dimensional Nanocrystals", US Patent 9,416,011 B2 issued 8/16/2016.
- 16) V. Natu, D. Zhao and M. W. Barsoum, "Crumpled Mesoporous MXene powders Synthesized by Acid-, Base- or Salt-Crumpling". Filed Dec. 2018
- 17) V. Natu and M. W. Barsoum, "Edge Capping of 2D-MXene Sheets with Polyanionic Salts to Mitigate Oxidation in Aqueous Colloidal Suspensions". Filed June 2019.
- 18) M. W. Barsoum and M. Sokol, "MAX Phase Gold Composites and Methods for Making the Same", Filed July 2019.
- 19) M. Ghidui, M. W. Barsoum, Y. Gogotsi, A. Fafarman and A. Dillon, "Physical Forms of MXene Materials Exhibiting Novel Electrical Characteristics", 10,573,768 B2, issued Feb. 2020.

PENDING/Abandoned

- 20) M. W. Barsoum and C. Hu, "Nanolaminated 2-2-1 Max-Phase Compositions", Nonprovisional patent filed.
- 21) M. W. Barsoum and C. Li, "Improved Route to MXene Carbides", PCT filed on Aug. 17, 2016.
- 22) S. Amini and M. W. Barsoum, "MAX-Based Metal Matrix Composites". Non-provisional patent filed. 12/477,825.
- 20) M. W. Barsoum, E. N. Hoffman and R. D. Doherty, "Reduction of Spontaneous Metal Whisker Formation". Abandoned.
- 21) Y. Gogotsi, G. Yushin, E.N. Hoffman, M. W. Barsoum, "Nanoporous Carbonaceous Membranes and Related Methods", PCT/US2007/011442.
- 22) Y. Gogotsi, G. Yushin, E. N. Hoffman & M.W. Barsoum, "Process for Producing Nanoporous CDCs with Large Specific Surface Area", PCT/US2006/045154.
- 23) A. Moseson, S. Basu and M. W. Barsoum, "A Novel Method for Zero Point Detection".
- 24) S. Amini and M. W. Barsoum, "MAX-Based Metal Matrix Composites". Non-provisional patent filed. 12/477,825.

BOOK CHAPTERS, INVITED AND REVIEW ARTICLES (Highlighted papers are noteworthy)

1. M. W. Barsoum and P. Eklund, "The $M_{n+1}AX_n$ Phases: The Precursors for MXenes", Ch. 2 in 2D Metal Carbides and Nitrides (MXenes), Eds. B. Anasori and Y. Gogotsi, Springer, Switzerland (2019).
2. M. Ghidui, M. Naguib and M. W. Barsoum, "Chemical and Electrochemical Intercalation of Ions and Molecules", Ch. 10 in 2D Metal Carbides and Nitrides (MXenes), Eds. B. Anasori and Y. Gogotsi, Springer, Switzerland (2019).
3. S. Kota, M. Sokol and M. W. Barsoum, "A Progress Report on the MAB Phases Atomically Laminated, Ternary Transition Metal Borides", Int. Mater. Rev., **65**, 226–255 (2020).
4. L. Verger, V. Natu, M. Carey and M. W. Barsoum, "MXenes: An Introduction", Trends Chem., **1**, 656-669 (2019).
5. M. Sokol, V. Natu, S. Kota and M. W. Barsoum, "On the Chemical Diversity of the MAX Phases", Trends Chem. **1**, 210-223 (2019).
6. L. Verger, C. Xu, V. Natu, H.-M. Cheng, W. Ren and M. W. Barsoum, "Overview of the Synthesis of MXenes and Other Ultrathin 2D Transition Metal Carbides and Nitrides," Curr. Opin. Solid State Mater. Sci., **23**, 149-163 (2019).
7. M. Naguib, V. Mochalin, M. W. Barsoum and Y. Gogotsi, "MXenes: A New Family of Two Dimensional Materials", Advan. Mater., **26**, 992 (2014). (Invited: 25 yr Anniversary Issue). **ISI Highly cited.**
8. M. Radovic and M. W. Barsoum, "The MAX Phases: Bridging the Gap Between Metals and Ceramics", Amer. Cer. Soc. Bull., **92**, 20-27, April 2013.
9. S. Gupta and M. W. Barsoum, "On the Tribology of the MAX Phases and Their Composites – A Review", Wear, **271**, 1878-1894 (2011).
10. M. W. Barsoum and M. Radovic, "The Elastic and Mechanical Properties of the MAX Phases", Annual Review of Materials Research, Eds. D. Clarke and M. Ruhle, **41**, 9.1-9.33 (2011). **ISI Highly cited.**
11. M. W. Barsoum and S. Basu, "Kinking Nonlinear Elastic Solids", Encyclopedia of Materials Science and Technology, Eds. K. H. J. Buschow, R. W. Cahn, M. C. Flemings, B. Ilshner, E. J. Kramer, S. Mahajan, and P. Veysiere, Elsevier, Oxford, 2010, Pages 1-23.
12. M. W. Barsoum, "The MAX Phases and Their Properties", Ceramics Science and Technology, Vol. 2: Properties, Eds. R. Riedel & I.-W. Chen, Wiley-VCH Verlag GmbH & Co., 299-345 (2010).
13. M. W. Barsoum, "Nanolayered Kinking Nonlinear Elastic Solids", Handbook of Nanomaterials, Ed. Y. Gogotsi, CRC Press, 2006.
14. M. W. Barsoum "Physical Properties of the MAX Phases", Encyclopedia of Materials Science & Technology, Eds. K. H. J. Buschow, R. W. Cahn, M. C. Flemings, E. J. Kramer, S. Mahajan and P. Veysiere, Elsevier Science, Amsterdam, 2006.
15. M. W. Barsoum and M. Radovic, "Mechanical Properties of the MAX Phases", Encyclopedia of Materials Science & Technology, Eds. K. H. J. Buschow, R. W. Cahn, M. C. Flemings, E. J. Kramer, S. Mahajan and P. Veysiere, Elsevier Science, Amsterdam, 2004.
16. M. W. Barsoum and T. El-Raghy, "The MAX Phases: Unique New Carbide and Nitride Materials", American Scientist, **89**, 336-345 (2001).
17. M. W. Barsoum, "The $M_{n+1}AX_n$ Phases: A New Class of Solids: Thermodynamically Stable Nanolaminates", Prog. Solid State Chem., **28**, 201 (2000). **≈ 3000 citations.**

18. M. W. Barsoum, T. El-Raghy and M. Radovic, "Ti₃SiC₂: A Layered Machinable Ductile Ceramic", *Interceram*, **49**, 226-233 (2000).
19. M. W. Barsoum, A. Zavaliangos, S. Kalidindi, T. El-Raghy and D. Brodtkin, "Transient Plastic Phase Processing of Ceramic-Ceramic Composites", *JOM*, November 1995, p. 52.
20. M. W. Barsoum, "Degradation of Ceramics in Alkali Metal Environments", *Science Technology of Fast Ion Conductors*, Eds. H. Tuller and M. Balkanski, NATO Advanced Study Institute. 241 (1989).

REFEREED JOURNAL PAPERS: (Highlighted papers are noteworthy)

ISI: h index: 91; Total citations > 40,000.
Google Scholar: h index 104; Total citations > 54,500.

2020

446. S. Kota, L. Verger, M. Sokol and M. W. Barsoum, "Thermal Stability of the Layered Transition Metal Boride Fe₂AlB₂ in N₂ and Ar Atmospheres," Sub. for pub.
445. Elmelegy, S. Kota, J. Wang, S. J. May, M. W. Barsoum, "Synthesis and Preliminary Characterization of the Bulk Fe₃SiB₂ and Mn₃SiB₂ Ternary Borides", Sub. for pub.
444. M. Nikolaevsky, R. Friedman, M. Dahlqvist, M. Hornik, E. Sterer, M. W. Barsoum, J. Rosen, A. Melchior, and E. N. Caspi, *J. Appl. Phys.* **127**, 145103 (2020).
- 443.X. Zhao, M. Sokol, M. W. Barsoum and L. Lamberson, "Effect of Grain Orientation on the Compressive Response of Highly Oriented MAX Phase Ti₃SiC₂", Sub. for pub.
442. T. K. Slot, V. Natu, E. Ramos-Fernandez, M. W. Barsoum, G. Rothenberg and N. R. Shiju, "On How Surface Modified Ti₃C₂T_x MXenes Enhance the Selectivity in Epoxide Ring Opening". Sub. for pub.
441. W. Zheng, J. Halim, A. El Ghazaly, A. S. Etman, L. Qin, B. Ahmed, J. Rosen and M. W. Barsoum, "Flexible free-standing MoO₃/Ti₃C₂T_z MXene composite films with high gravimetric and volumetric supercapacitances," Sub. for pub.
440. M. Benchakar, L. Loupias, C. Garnero, T. Bilyk, C. Morais, C. Canaff, N. Guignard, S. Morisset, H. Pazniak, S. Hurand, P. Chartier, J. Pacaud, V. Mauchamp, M. W. Barsoum, A. Habrioux and S. Célérier, "One MAX Phase, Different MXenes: A Guideline to Understand the Crucial Role of Etching Conditions on Ti₃C₂T_x Surface Chemistries," Sub. for pub.
439. S. Bennett, S. Kota, H. ElBidweihy, J. F. Parker, L. Hanner, P. Finkel, M. W. Barsoum, "Magnetic and Magnetocaloric Properties of Fe₂AlB₂ Synthesized by Single-Step Reactive Hot Pressing", *Scrip. Mater.* Accepted.
438. M. Nikolaevsky, E. N. Caspi, R. Friedman, M. Hornik, E. Sterer, S. Kota, M. W. Barsoum, M. Dahlqvist, J. Rosen, and A. Melchior, "Possible Monoclinic Distortion of Mo₂GaC Under High Pressure", *J. Appl. Phys.* **127**, 145103 (2020).
437. D. Potashnikov, E.N. Caspi, L. A. Hanner, A. Pesach, S. Kota, M. Sokol, M. W. Barsoum, H. Evans, A. Eyal, A. Keren and O. Rivin, "Magnetic Phase Diagram of (Fe_{1-x}Mn_x)₂AlB₂, x = 0 to 1, Solid Solution Powders Explored by Neutron Diffraction and Magnetization Measurements", *Phys. Rev. Mater.* Accepted (2020).
436. M. Benchakar, V. Natu, T. A. Elmelegy, J. Snyder, C. Morais, S. Célérier, A. Habrioux and M. W. Barsoum, "Two-dimensional MoS₂/Mo₂CT_x Heterostructures Obtained From Topotactic Sulfurization of Mo₂CT_x MXene As Highly Efficient Catalyst Towards Hydrogen Evolution Reaction", *J. Electrochem. Soc.* Accepted (2020).
435. H. Badr, A. Champagne, T. Ouisse, J.-C. Charlier and M. W. Barsoum, "Elastic and Hardness Properties of V₂AlC and Cr₂AlC MAX Phase Single Crystals", *Phys. Rev. Mater.* Accepted (2020).

434. M. W. Barsoum, "Rippllocations; a Progress Report", *Front. Mater.* **7**, 146 (2020).
433. W. Wang, M. Sokol, S. Kota and M. W. Barsoum, "Reaction Paths and Microstructures of Nickel and Ti_2AlC Mixtures Reacted in the 1050–1350 °C Temperature Range," *J. Alloy Comps.*, **828**, 154193 (2020).
432. M. Benchakar, L. Loupias, C. Garnero, T. Bilyk, C. Morais, C. Canaff, N. Guignard, S. Morisset, H. Pazniak, S. Hurand, P. Chartier, J. Pacaud, V. Mauchamp, M. W. Barsoum, A. Habrioux and S. Célérier, "One MAX Phase, Different MXenes: a Guideline to Understand the Crucial Role of Etching Conditions on $Ti_3C_2T_x$ Surface Chemistry", *Appl. Surf. Sci.* accepted.
431. Y. Kim, A. Gkountaras, O. Chaix-Pluchery, I. Gerald, J. Coraux, V. Bouchiat, M. W. Barsoum and T. Ouisse, "Elementary Processes Governing V_2AlC Chemical Etching in HF," *RSC Advances*, accepted (2020).
430. A. Champagne, F. Ricci, M. Barbier, T. Ouisse, D. Magnin, S. Ryelandt, T. Pardoën, G. Hautier, M. W. Barsoum and J.-C. Charlier, "Insights Into the Elastic Properties of RE-*i*-MAX Phases and Their Potential Exfoliation into 2D RE-*i*-MXenes", *Phys. Rev. Mater.* **4**, 013604 (2020).
429. V. Natu, S. Kota and M. W. Barsoum, "XPS of Layered, Ternary, Transition Borides (MAB Phases) and their Binary Monoborides", *J. Europ. Cer. Soc.*, **40**, 305–314 (2020).
428. V. Natu, R. Pai, M. Sokol, M. Carey, V. Carla and M. W. Barsoum, "2D $Ti_3C_2T_z$ MXene Synthesized by Water-free Etching of Ti_3AlC_2 in Polar Organic Solvents," *Chem.* **6**, 616–630 (2020). Featured Article.
427. M. Carey, Z. Hinton, M. Sokol, V. Natu, N. Alvarez and M. W. Barsoum, "Dispersion and Stabilization of Alkylated $Ti_3C_2T_z$ MXene in Nonpolar Solvents", *Cell Rep. Phys. Sci.* Accepted (2020).
426. A. Gountaras, Y. Kim, J. Coraux, V. Bouchiat, S. Lisi, M. W. Barsoum and T. Ouisse, "Mechanical Exfoliation of Select MAX Phases and $Mo_4Ce_4Al_7C_3$ Single Crystals to Produce MAXenes," *Small*, **16**, 1905784 (2020).
425. L. Yang, W. Zheng, P. Zhang, W. He, W. Zhang, W. Tian, M. W. Barsoum, Z.-M. Sun, "Freestanding Films Comprised of Nanoporous Nitrogen-doped Ti_3C_2 Nanosheets for High Performance Supercapacitors", Sub. for pub.
424. M. M. Trandafir, F. Neatu, S. Neatu, A. Kuncser, E. I. Cuclea, V. Natu, M. W. Barsoum and M. Florea, "Highly Efficient Ultra-lowLoading Pd Supported on MAX Phases for Chemoselective Hydrogenation", *ACS Catalysis*, **10**, 5899 (2020).
423. G. Li, V. Natu, T. Shi, M. W. Barsoum and L. V. Titova, "Microscopic Conductivity and Ultrafast Carrier Dynamics in $Mo_2Ti_2C_3T_z$ and $Mo_2TiC_2T_z$ (MXenes): A THz Spectroscopic Study", *ACS Appl. Energy Mater.* **3**, 1530-1539 (2020).
422. A. M. Jastrzębska, A. Szuplewska, A. Rozmysłowska-Wojciechowska, S. Poźniak, M. Chudy, A. Olszyna, M. Birowska, M. Popielski, J. A. Majewski, B. Scheibe, V. Natu and M. W. Barsoum, "On the Cytotoxicity of 2D Ti_3C_2 MXene After Delamination", *2D Materials*, **7**, 025018 (2020).
421. V. Bayram, M. Ghidui, M. W. Barsoum, I. A. Kinloch and S. Barg, "Directional Solidification of MXene Tunable Lamellae Architectures for Supercapacitor Electrodes and Other Applications." *ACS Appl. Energy Mater.* Accepted. (2020).
420. J. Gruber, M. W. Barsoum and G. J. Tucker, "Characterization of Rippllocation Mobility in Graphite", *Mater. Res. Lett.* **8**, 82 (2020).
419. H. Badr, X. Zhao, S. Koumlis, G. Tucker, L. Lamberson and M. W. Barsoum, "Effect of Thickness and Confining Load on Rippllocation Mechanics of Thin Steel Sheets", Sub. for pub.

418. M. Sokol, S. Kalabukhov, E. B. Zaretsky and M. W. Barsoum, "On the Abnormal Response of Ti_3SiC_2 Under High Strain-Rate Deformation", Phys. Rev. Mater. **3**, 063610 (2019). Editor's choice.
417. K. Montazeri, M. Currie, L. Verger, P. Dianat, M. W. Barsoum and B. Nabet, "Beyond Gold: Spin Coated Ti_3C_2 -Based MXene Photodetectors", Adv. Mater., **31**, 1903271 (2019).
416. V. Natu, J. L. Hart, H. Chiang, M. L. Taheri and M. W. Barsoum, "Edge Capping of 2D-MXene Sheets with Polyanionic Salts to Mitigate Oxidation in Aqueous Colloidal Suspensions", Angew. Chem. Inter. Ed. **58**, 12655–12660 (2019). Editor's Designation: Hot paper.
415. L. Verger, V. Natu, M. Ghidui and M. W. Barsoum, "Effect of Cationic Exchange on the Hydration and Swelling Behavior of $\text{Ti}_3\text{C}_2\text{T}_z$ MXene", J. Phys. Chem. C, **123**, 20044–20050 (2019).
414. A. Champagne, O. Chaix-Pluchery, T. Ouisse, D. Pinek, I. Gelard, L. Jouffret, Q. Tao, J. Rosen, M. W. Barsoum and J.-C. Charlier, "Vibrational Behavior of Rare-Earth Containing *i*-MAX Phases ($\text{Mo}_{2/3}\text{RE}_{1/3}$) $_2\text{AlC}$ (RE = Nd, Gd, Dy, Ho, Er) from First-Order Raman Scattering", Phys. Rev. Mater. **3**, 053609 (2019).
413. M. Griseri, B. Tunca, T. Lapauw, S. Huang, L. Popescu, K. Lambrinou, J. Vleugels and M. W. Barsoum, "Synthesis, Properties and Thermal Decomposition of the Ta_4AlC_3 MAX Phase", J. Eur. Cer. Soc. **39**, 2973-2981 (2019).
412. T. Ouisse, D. Pinek and M. W. Barsoum, "Modelling In-plane Magneto-transport in Cr_2AlC ", Ceram. Inter. **45**, 22956 (2019).
411. J. Aslin, E. Mariani, K. Dawson and M. W. Barsoum, "Ripplocations Provide a New Mechanism for the Deformation of Phyllosilicates in the Lithosphere", Nat. Comm. **10**, 686 (2019).
410. M. Carey, G. Palmese and M. W. Barsoum, "Water Transport and Mechanical Properties of Epoxy/ $\text{Ti}_3\text{C}_2\text{T}_z$ MXene Nanocomposites", ACS Appl Mater Interfaces, **11**, 39143-39149 (2019).
409. J. Halim, K. M. Cook, P. Eklund, J. Rosen and M. W. Barsoum, "XPS of Cold Pressed Multilayered and Freestanding Delaminated 2D Thin Films of $\text{Mo}_2\text{TiC}_2\text{T}_z$ and $\text{Mo}_2\text{Ti}_2\text{C}_3\text{T}_z$ (MXenes)," Appl. Surf. Sci., **494**, 1138-1147 (2019).
408. J. Halim, I. Persson, E. J. Moon, P. Kühne, V. Darakchieva, S. J. May, P. O. Å. Persson, P. Eklund, J. Rosen and M. W. Barsoum, "Electronic and Optical Characterization of 2D Ti_2C and Nb_2C (MXene) Thin Films", J. Phys.: Condens. Matter., **31**, 165301 (2019).
407. J. Ward, D. Bowden, D. Stewart, M. W. Barsoum, P. Frankel and M. Preuss, "Influence of Proton-irradiation Temperature on the Damage Accumulation in Ti_3SiC_2 and Ti_3AlC_2 ", Scrip. Mater., **165**, 98-102 (2019).
406. J. D. Coburn, T. E. Gebhart, C. M. Parish, E. Unterberg, J. Canik, M. W. Barsoum and M. Bourham, "Surface Erosion of Plasma-Facing Materials Using An Electrothermal Plasma Source and Ion Beam Microtrenches", Fusion Sci. Technol. **75**, 621 (2019).
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3. H. L. Tuller and M. W. Barsoum, "Electrolytic Control and Detection of Ionic Species Using Fast-Ion Conducting Glasses", *Proceedings of the Int. Conf. on Solid State Transducers*, Philadelphia, PA, IEEE Press, 1985. Invited Paper, p. 256.
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16. D. Brodtkin, A. Zavaliangos, S. Kalidindi & M. W. Barsoum, "Microstructural Optimization and Mechanical Properties of Titanium Carbide-Titanium Boride Composites Fabricated by Transient Plastic Phase Processing". Processing and Fabrication of Advanced Materials IV, T.S. Srivatsan and J.J. Moore (Eds.), pp. 189-198, TMS, Warrendale, PA 1996.
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25. I. M. Low, M. Singh, P. Manurung, E. Wren, D. P. Sheppard, M.W. Barsoum, "Depth profiling of phase composition and texture in layered-graded Al_2O_3 - & Ti_3SiC_2 -based systems using X-ray and synchrotron radiation diffraction", HIGH-PERFORMANCE CERAMICS 2001, PROC. KEY ENGINEERING MATERIALS 224-2: 505-510, 2002.
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27. A. Kontsos, K. Hazeli, M. W. Barsoum, B. Anasori, T. Loutas, G. Sotiriadis and V. Kostopoulos: "Grain Size Effect on the Fatigue Response of Nanocrystalline Mg Composites Reinforced with MAX Phases", 9th HSTAM Intern. Cong. on Mechanics-Limassol, Cyprus, July 2010; Eds. P. Papanastasiou et al., pp 603-610.
28. P. Finkel, A. G. Zhou, S. Basu, O. Yeheskel & M. W. Barsoum, "On the Observation of Acoustic-Elastic Hysteresis in Kinking Non-linear Elastic Solids", AIP Conf. Proc. **1096**, pp. 231-237, 2009.

29. B. Anasori, S. Amini, V. Presser and M. W. Barsoum, "Nanocrystalline Mg-Matrix Composites with Ultrahigh Damping Properties", **Magnesium Tech.** **2011**, *Eds:* W. H. Sillekens, S. R. Agnew, N. R. Neelameggham and S. N. Mathaudhu TMS, The Minerals, Metals & Materials Society, (2011) pp. 463-468.
30. B. Anasori and M. W. Barsoum: "On the Effect of Ti₂AlC on the Fabrication of Extraordinary Thermally Stable Mg Nano Grains", **Magnesium Tech** **2012**, John Wiley & Sons, Inc. New York.

MONOGRAPHS

M. J. Koczak, K. Prewo, A. Mortensen, S. Fishman, M. W. Barsoum & R. Gottschall, "Inorganic Composite Materials in Japan: Status and Trends", ONR Research Scientific Bull., Nov. 1989.

PRESENTATIONS

Invited Talks: (Highlighted talks are noteworthy).

257. Université Paul Sabatier, Toulouse, France, February 2020. MXene
256. Arizona State University, Phoenix, AZ, January 2020. MXene
255. **Keynote:** 44th ICACC in Daytona Beach, FL, January 2020. MXene
254. University of North Texas, Denton, TX, January 2020. MAX/MXene.
253. University of Illinois-Chicago, Chicago, IL, November 2019. MXene
252. Inter. Symposium Cluster and Nanomaterials, Richmond, VA, Nov. 3-7, 2019. MXene.
251. Beilstein Nanotechnology Symposium, Mainz, Germany, Oct. 2019. MXene.
250. **Keynote:** Swedish Phys. Soc. Meeting, Linkoping U, Linkoping, Sweden, Oct. 2019; Pyramid talk.
249. **Plenary:** 5th Inter. Conf. Advances in Functional Mater., Washington, DC, July 2019.
248. 2nd New England Energy Research Forum, WPI, Worcester, MA, June 2019, MXene
247. ASM Annual Symposium, GE Research, June 2019, Niskayuna, NY. MAX phases.
246. Advanced Accident and Radiation-Tolerant Materials Conf., Cambridge UK, March 2019.
245. **Plenary:** Université de Poitiers, Poitiers, France, March. 2019; MXenes.
244. Polytechnic of Torino, Torino, Italy, February 2019, MAX/MXene.
243. **Keynote:** Long-Period Stacking Ordered Structure, Kumamoto, Japan, Dec. 2018; Rippl.
242. U. of Liverpool, Liverpool England, Sept. 2018, Rippl.
241. **Plenary:** Inter. Workshop MAX for Harsh Environ. Poitiers, France, Nov. 2018. MAX/MXene.
240. CIMTEC, Perugia, Italy; June 2018; Rippllocations.
239. U.S. Army Research Laboratory, Aberdeen Proving Grounds, May 2018; MAX.
238. U. of Belgrade, Belgrade, Serbia, May 2018, MAX/MXene.
237. Inter. Workshop of Materials Physics, Bucharest, Romania, May 2018, MAX/MXene
236. 1st Inter. Conf. on MXenes for Energy Applications, Changchung, China, May 2018 MXene
235. **Plenary:** 2nd IMSEGE Conf.; Rabat, Morocco, April 2018. MAX/MXene.
234. **German Physical Society Meeting**, Berlin, Germany, April 2018. MAX/MXene.
233. 42th ICACC in Daytona Beach, FL, January 2018. MXene
232. South Eastern Univ. Nanjing, China, Nov. 2017, MAX/MXene.
231. **Plenary:** 10th Inter. Conf. on High Perform. Ceramics; Nanchang; China, Nov. 2017. Ripp.
230. Belgian Ceramic Center, Mons, Belgium, Oct. 2017. MAX/MXene
229. Centre for Microscopy & Spectroscopy with Electrons Res. Center, Juelich, Germany, Oct. 2017
228. MiFuN 2017, Duisburg, Germany, Oct. 2017. Rippllocations
227. Inter. Conf. of Funct. Nanomater. & Nanodevices, Budapest, Hungary, Sept. 2017. MAX/MXene
226. **Plenary:** YUCOMAT 2017 Conference, Montenegro, Sept. 2017. MAX/MXene
225. **Plenary:** Long-Period Stacking Ordered Structure, Kyoto, Japan, Dec. 2016; Rippllocations.
224. North Carolina State Univ., Chapel Hill, NC; Nov. 2016; Rippllocations.
223. **Plenary:** Inter. Conf. Techn. Advan. Mater., New Delhi, Nov. 2016; MAX/MXene
222. Texas A&M, College Station, TX, Sept. 2016; Rippllocations.
221. Texas A&M, College Station, TX, Sept. 2016; MAX/MXene.
220. American Chemical Soc., Annual Meeting, Philadelphia, Aug. 2016; MXene talk.
219. American Nuclear Soc., Annual Meeting, New Orleans, June 2016, MAX for Nuclear Applications

218. NSUF Users Meeting, Idaho Falls, June 2016, MAX for Nuclear Applications.
217. Tsinghua University, Beijing, China, May 2016, MAX/MXene.
216. Beijing Jiaotong Univ., Beijing, China, May 2016, MAX/MXene.
215. Institut Neel, CNRS, Grenoble, France, April 2016; MXene.
214. LMI/CNRS, Univ. Lyon 1, Lyon, France, March 2016. Pyramid talk.
213. LMI/CNRS, Univ. Lyon 1, Lyon, France, March 2016. MAX/MXene.
212. **MINATEC**, Institute Polytechnique de Grenoble, Grenoble, France, March 2016: Rippllocations.
211. TU Delft, Delft, Holland, March 2016: MAX/MXene.
210. SCK•CEN; Belgium, March 2016: MAX for Nuclear Applications.
209. KU-Leuven, Leuven, Belgium, March 2016: MAX/MXene.
208. Institute Polytechnique de Grenoble, Grenoble, France, Feb. 2016: MAX/MXene.
207. Varinor International SA, Delemont, Switzerland, Feb. 2016: MAX Phases.
206. RWTH Aachen, Aachen, Germany; Feb. 2016: MAX/MXene.
205. RWTH Aachen, Aachen, Germany; Feb. 2016: Pyramid talk.
204. Queens Mary University, London, December 2015: Pyramid talk.
203. Queens Mary University, London, December 2015; MAX/MXene.
202. Helmut Schmidt U., Hamburg, November 2015; MAX/MXene.
201. National Nuclear Laboratory, Preston, UK: November 2015: MAX for Nuclear Applications.
200. University of Padua, Padua, Italy, November 2015: MAX/MXene.
199. University of Padua, Padua, Italy, November 2015: Pyramid Talk.
198. **Oxford University, Oxford, UK**, October 2015: MAX/MXene.
197. **Imperial College, London, UK**, Fall 2015: A series of 5 lectures on the MAX phases.
196. Imperial College, London, UK, Oct. 2015: Pyramid Talk.
195. **Cambridge University, Cambridge, UK**, Oct. 2015: Rippllocations/Layered Solids
194. Cambridge University, Cambridge, UK, October 2015: MAX/MXene.
193. University of Manchester, Manchester, UK. October 2015: MAX for nuclear Appl.
192. Materials for Extreme Environments, Birmingham, UK, Oct. 2015: MAX for Nuclear Applications
191. University of Amsterdam, Holland, Sept. 2015: MAX/MXene.
190. 11th Inter. Conf. Ceram. Mater. Energy Environ. Appl., June 2015, Vancouver, BC, MAX/MXene.
189. **WHYY Studios**: Philadelphia Science Festival, April 2015, "Molding conductive 'clay' into the next generation of Li_xSFP batteries".
188. **TEDx Talk**, Drexel University, Phila. PA. April 2015. "Money for Nothing, Discoveries for Free"
187. Florida International University, Miami, FL, April 2015: MAX/MXene.
186. Florida International University, April 2015: Pyramid talk.
185. **German Physical Society Meeting**, Berlin, Germany, March 2015: MAX/MXene.
184. 39th ICACC in Daytona Beach, FL, January 2015: MAX Phases for Nuclear Applications.
183. University of Tennessee, Knoxville, TN, Oct. 2014; Pyramid talk.
182. University of Duisburg, Duisburg, Germany, Oct. 2014: From 3D to 2D.
181. **Plenary**; Long-Period Stacking Ordered Structure, Kumamoto, Oct. 2014 Japan; MAX/Mg
180. **Plenary**; 13th Intern. Ceram. Congress, Montecatini Terme, Italy; June 2014; 3D to 2D.
179. International Materials for Aerospace for Aeronautical Materials, Blida, June 2014 Algiers; MAX
178. U.S. Army Research Laboratory, Aberdeen Proving Grounds, May 2014; Pyramid talk
177. Microstructural Functionality: Dynamics, Adaption, and Self- Healing at the Nanoscale, Duisburg, Germany, April 2014; KNE.
176. Ningbo Institute of Maters. Tech. and Engin., Ningbo, China, Nov. 2013; Two talks on MAX phases
175. **Plenary Lecture**: 8th Inter. Conf. on High Performance Ceram.; Chungqing; China, Nov. 2013. MAX
174. **Royal Swedish Academy of Engineering Sciences**, Stockholm, Sweden, Oct. 2013. Future Materials - Impact on Society.
173. Oak Ridge National Lab, Oak Ridge, TN, August 2013, KNE/ND
172. United Technology Research Center, June 2013, Hartford, CT, MAX talk.
171. BATT Conference, Washington, DC, May 2013, MXene talk
170. U. of Puerto Rico, Puerto Rico, April 2013; MXene talk.
169. Linkoping University, Linkoping, Sweden, March 2013; MXene talk.

168. EMPA, Geisen, Switzerland, March 2013, MAX talk
167. NASA, Cleveland OH. Oct. 2012, MAX for high temperature applications.
166. **Keynote Lecture:** Long-Period Stacking Ordered Structure, Sapporo, Japan; Oct. 2012, MAX/KNE.
165. Picatinny Arsenal, NJ, Sept. 2012; MAX/Mg talk
164. Linköping University, Linköping, Sweden, May 2012, MXene talk.
163. Université de Poitiers, Poitiers, France, Feb. 2011; MXene talk.
162. **Keynote Lecture,** Fray International Symposium, Nov. 2011, Cancun, Mexico
161. Université de Poitiers, Poitiers, France, Oct. 2011; Pyramid talk.
160. MS&T'11 Fall Meeting, Columbus, OH, Oct. 2011; Nanoindentation talk.
159. MS&T'11 Fall Meeting, Columbus, OH, Oct. 2011; MAX-MET talk.
158. Rutgers University, New Brunswick, NJ, Oct. 2011; Pyramid talk.
157. Haldor Topsøe, Copenhagen, Denmark, March 2011; MAX phase talk
156. Society of Danish Chemical Engineers, Copenhagen, Denmark, March 2011; Pyramid talk
155. Linköping University, Linköping, Sweden, March 2011, MAX phase derivatives.
154. Loyola University, Baltimore, MD, Feb. 2011, Pyramid talk
153. General Electric Research Center, Schenectady, NY., December, 2010; MAX phases.
152. **Plenary Lecture:** 7th Inter. Conf. on High Temp. Ceram. Matrix Comp., Bayreuth, Germany, Sept. 2010. MAX phase talk.
151. Paul Scherrer Institute, Zurich, Switzerland, July 2010; MAX/KNE talk.
150. EMPA, Thun, Switzerland, July 2010; MAX/KNE/NI talk.
149. CIMTEC, Montecatini, Italy, June, 2010. MAX/KNE talk.
148. **Keynote Lecture:** 1st Intern. Conf. Mater. for Energy 2010, Karlsruhe, Germany, July 2010. MAX.
147. Harbin Institute of Technology, Harbin, China, May 2010; Mech. props. of MAX phases.
146. Harbin Institute of Technology, Harbin, China, May 2010; Physical props. of MAX phases.
145. ASM Brandywine Chapter, April 2010, Brandywine PA; Pyramid talk.
144. CAMTEC II, Cambridge, England, March 2010; NI/KNE talk.
143. 34th ICACC in Daytona Beach, FL, January 2010; MAX phase talk
142. 34th ICACC in Daytona Beach, FL, January 2010; Pyramid Talk
141. Science Café, Santa Fe Alliance for Science, Santa Fe, NM; January 2010, Pyramid talk.
140. Washington University, St. Louis, Mo, November, 2009; Pyramid talk.
139. Lake Louise Conference, Lake Louise, Canada, Oct. 2009; Pyramid talk
138. Lake Louise Conference, Lake Louise, Canada, Oct. 2009; MAX talk
137. TM&S Fall Meeting, Pittsburgh, PA, Oct. 2009; MAX talk.
136. Right Angle Club, Philadelphia, PA, Oct. 2009, Pyramid talk.
135. Florida Institute of Technology, Melbourne, Fl, Oct. 2009, Pyramid talk.
134. MS&T'09 Fall Meeting, Pittsburgh, Oct. 2009, MAX talk.
133. RWTH Aachen, Aachen, Germany; Sept. 2009, MAX/KNE talk
132. Los Alamos National Lab, Los Alamos, NM, June 2009; Pyramid talk.
131. Amer. Cer. Soc. PACRIM8 Meeting, June 2009, Vancouver, Canada; Pyramid talk.
130. Uppsala Univ., Uppsala, Sweden, May 2009; MAX/KNE talk.
129. Uppsala University, Uppsala, Sweden, May 2009; Pyramid talk.
128. Inter. Conf. on Metall. Coating & Thin Films. San Diego, CA, April 2009; MAX/KNE talk.
127. Los Alamos National Lab, Los Alamos, NM, March 2009; Pyramid talk.
126. Los Alamos National Lab., Los Alamos, NM, Feb. 2009; Pyramid talk.
125. Linköping University, Linköping, November, Nov. 2008. Pyramid talk.
124. Linköping University, Linköping, November, Nov. 2008. MAX talk.
123. Anna Maria Workshop IX, Anna Maria Island, Nov. 2008. Pyramid talk.
122. Anna Maria Workshop IX, Anna Maria Island, Nov. 2008. Alternative cement talk.
121. MS&T, Pittsburgh, PA, Oct. 2008. Pyramid talk.
120. MS&T, Pittsburgh, PA, Oct. 2008. Spherical Nanoindentation Stress-Strain Curves, Kinking Nonlinear Elastic Solids and Low Dimensionality Solids.
119. E-MRS Fall Meeting, Warsaw, Poland, Sept. 2008. MAX/KNE talk.

118. Special Workshop: "Radiation Stability of Complex Microstructures"; Santa Fe, NM, Sept. 2008, Compression creep of ceramics and MAX phases.
117. Rutgers University, New Brunswick, NJ, Sept. 2008. Pyramid Talk
116. Director's Colloquium, Savannah River National Lab., Aiken, SC, May 2008; Pyramid Talk.
115. Sigma Xi Lecture, MIT, Cambridge, MA, May 2008; Pyramid talk.
114. NIST, Gaithersburg, MD. April 2008, Pyramid talk.
113. ASM Liberty Bell Chapter, Sustaining Members Night, April 2008; Pyramid talk.
112. Dupont Experimental Station, Delaware, March 2008; MAX/KNE talk.
111. 13th Israeli Materials Engineering Conference, December 2007; Pyramid talk.
110. Plenary Lecture, 13th Israeli Materials Engineering Conference, Dec. 2007; MAX/KNE talk.
109. MRS Fall 2007 Meeting, Boston, MA, Nov. 26-28, 2007, Symposium Y; Pyramid talk.
108. Center for Talented Youth, Johns Hopkins Univ., 2007 Science and Technology Series, Family Academic Programs, Oct. 2007. Pyramid Talk.
107. Gordon Research Conf., High Temperature Corrosion; New London, NH; August 2007. MAX oxidation.
106. Los Alamos National Lab., Los Alamos, NM, April 2007; MAX talk.
105. Laval University, Quebec City, Canada, May 2007, Pyramid talk.
104. International Cement Microscopy Assoc. Conf., Quebec City, Canada, May 2007, Open debate on whether cast blocks were used in construction of the Pyramids of Egypt.
103. 6th Adv. Workshop on Engin. Ceram., Smolenice Castle, Slovakia, May 2007; KNE talk
102. 6th Adv. Workshop on Engin. Ceram., Smolenice Castle, Slovakia, May 2007; Pyramid talk
101. Los Alamos National Lab., Los Alamos, NM, April 2007; Nanoindentation talk.
100. Los Alamos National Lab., Los Alamos, NM, April 2007; KNE Talk
99. Los Alamos National Laboratory, Los Alamos, NM, April 2007; Pyramid Talk
98. Texas A&M, College Station, TX, March 2007; Pyramid talk
97. Texas A&M, College Station, TX, March 2007; Kinking Nonlinear Elastic Solids talk.
96. International Center of Diffraction Data, Newtown Square, PA March 2007; Pyramid talk.
95. Keynote speaker, National Consortium of Specialized Secondary Schools of Math, Science, and Technology, Drexel University, March 2007. Pyramid Talk.
94. Johns Hopkins University, Baltimore, MD, March 2007. Kinking Nonlin. Elastic Solids Talk
93. Drexel University, Engineering New Frontiers Lecture, February 2007. Pyramid Talk
92. Columbia University, Geology Department, New York, January 2007. Pyramid Talk
91. MS&T Fall 2006 Meeting, Cincinnati, OH (two different invited talks).
90. Frontiers in Materials Research Workshop, Center for Advanced Interdisciplinary Research, Vina del Mar, Chile, Oct. 2006.
89. University of Gottingen, Gottingen, Germany, July 2006.
88. CIMTEC, Italy, June 2006.
87. Oak Ridge National Laboratory, Oak Ridge, TN, April 21, 2006. Pyramid Talk.
86. Oak Ridge National Laboratory, Oak Ridge, TN, April 19, 2006.
85. Drexel University, Department of Materials Science and Engineering, April 2006.
84. CEA, Saclay, France, March 2006.
83. AVS International Symposium, Boston, USA, October 30th to November 4th, 2005.
82. ONERA, Paris, September 2005.
81. SMEC Conf., Florida International University, Miami, FL, April 2005.
80. Caterpillar, Technology & Solutions Division, Peoria, IL, January 2005
79. 29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL
78. NIST, Gaithersburg, MD, December 2004.
77. IBM, Poughkeepsie, New York, December 2004.
76. DOE Workshop on Ceramics Ductilization, Santa Fe, NM, November 2004.
75. Aberdeen Proving Grounds, ARL, Aberdeen, MD, October 2004.
74. CNRS/Ecole Centrale de Lyon, Lyon, France, September 18, 2004.
73. CNRS/Ecole Centrale de Lyon, Lyon, France, September 16, 2004.
72. University of Grenoble, Grenoble, France, September 14, 2004.

71. Polish Academy of Sciences, Wroclaw, Poland, May 2004.
70. Uppsala University, Uppsala, Sweden, May 2004, MAX phases
69. Virginia Tech. University, Blacksburg, VA, March 2004, MAX phases.
68. Seoul National University, Seoul, S. Korea, Oct. 2003.
67. 1st International Symposium on Nanostructured Materials, Seoul, S. Korea, Oct. 2003.
66. University of Poitiers, Poitiers, France, July 2003, MAX phases
65. Rutgers University, New Brunswick, March 2003, MAX phases
64. Oak Ridge National Laboratory, Oak Ridge, TN, Feb. 2003. MAX phases.
63. ONERA, Paris, France, June 2002. MAX phases.
62. University of Poitiers, Poitiers, France, June 2002. MAX phases.
61. CNRS/Ecole Centrale de Lyon, Lyon, France, June 2002. MAX phases.
60. GE Aircraft Engines, Cincinnati, OH, May 2002. MAX phases.
59. University of Missouri-Rolla, Rolla, MO, April 2002. MAX phases.
58. AIST, Sendai, Japan, March 2002. MAX phases.
57. Tohoku University, Sendai, Japan, March 2002. MAX phases.
56. Cerratec Inc., Sendai, Japan, March 2002. MAX phases.
55. Drexel University, Phila., PA, February 2002. MAX phases.
54. U. of Pennsylvania, Phila. PA. October 2001. MAX phases.
53. U. of Maryland, College Park, MD, Sept. 2001, MAX phases.
52. Naval Research Lab., Wash. DC., Sept. 2001, MAX phases
51. Technische Univ. Clausthal, Clausthal, Germany, June 2001.
50. U. of Hamburg, Hamburg, Germany, June 2001.
49. U. of Ulm, Ulm, Germany, May 2001.
48. AEA Technology, Oxford, England, April 2001.
47. Uppsala Univ., Uppsala, Sweden, Workshop on Experimental and Theoretical Studies of Designer Materials, April 2001.
46. Oxford University, Oxford, England, April 2001.
45. U. of Karlsruhe, Karlsruhe, Germany, March 2001, MAX phases
44. Federal Instit. of Tech., Lausanne, Switzerland, Feb. 2001
Technical Univ. of Eindhoven, Netherland, Feb. 2001
43. U. of Groningen, Holland, Feb. 2001
42. Max-Planck Institute, Stuttgart, Germany, Dec. 2000.
41. ABB Corp., Sweden, Dec. 2000.
40. Uppsala University, Sweden, Dec. 2000, MAX phases
39. Linkoping University, Sweden, Dec. 2000. MAX phases
38. Hilti Corp., Lichtenstein, Dec. 2000.
37. Chalmers University of Tech., Sweden, Dec. 2000, MAX phases
36. Kanthal Corp., Sweden, Dec. 2000, MAX phases
35. Univ. of Vienna, Austria, Nov. 2000, MAX phases
34. Ecole Centrale de Lyon, France, Nov. 2000.
33. Polytech. Instit. Milano, Italy, Nov. 2000.
32. El-Tech Corp., Cleveland, OH, July 2000.
31. Brush-Wellman, Cleveland, OH, Feb. 2000.
30. University of Illinois-Chicago, Chicago, IL, April 2000.
29. Praxair, Indianapolis IN, Oct. 1999.
28. Black and Decker, Towson, MD, Oct. 1999.
27. Oak Ridge National Lab., Oak Ridge, TN, Oct. 1998.
26. TMS Fall Meeting, Chicago, Ill, Oct. 1998.
25. AMP Incorporated, Harrisburg, PA, June 1998.
24. University of Illinois, Urbana, Ill, April 1998.
23. Symposium on "Innovative Processing and Synthesis of Ceramics, Glasses, and Composites", 100th Annual Meeting of the American Ceramic Society in Cincinnati, OH, May 3-6, 1998.
22. Vesuvius Research Pittsburgh, PA, Feb. 1998.

21. ALCOA Tech. Center, Pittsburgh, PA, Feb. 1998.
20. National Institute for Standards and Technology, Gaithersburg, MD. September 1997.
19. Cabot Corporation, Boyertown, PA, Sept. 1996.
18. Wright-Patterson AFB, Dayton, OH, July 1996.
17. M. W. Kellogg, Houston, TX, July 1996.
16. ART, Buffalo, NY, May 1996.
15. University Of Penn, Phila., PA, May 1996.
14. Norton-Saint Gobain, Northboro, MA, April 1996.
13. Drexel University, Phila, PA, Feb. 1996.
12. GE Corporate Research and Development, Schenectady, N.Y., January 1996.
11. Max-Planck Institute Pulver Metallurgisches Laboratorium, Stuttgart, Germany, "Role of Silicon Oxynitride During Nitridation of Si Powders in Nitrogen, June 1994.
10. Max-Planck Institute Fur Festkorperforschung, Stuttgart, Germany, "Reduction Kinetics and Electrical Conductivity in Lead-Disilicate Based Glasses", May 1994.
9. NASA-Lewis Research Center, Cleveland, OH, "Fiber-Reinforced Ceramic Matrix Composites", February 1993.
8. Penn State, State College, Department of Materials Science and Engineering, "Transient Plastic Phase Processing of Ceramics", February 1993.
7. Purdue University, Lafayette, In., Department of Materials Engineering, "Transient Plastic Phase Processing of Ceramic Composites", November 1992.
6. Princeton University Plasma Physics Lab. Lecture Series, "Sun Dragon: The Making of a Solar Car", January 1992, Princeton, NJ
5. TMS Fall Meeting, "In-situ Processing of Ceramic/Ceramic Composites by Solid/Solid Reactions", October 8-11, 1991, Cincinnati, Ohio.
4. American Chemical Society (Education Division), "Glass Matrix Composites: Processing and Properties", August 1990, Wash., D.C.
3. Rutgers University, Piscataway, NJ, "Fiber-Reinforced Ceramics: Theory vs. Expt.", Oct. 1989.
2. Tokyo Institute of Technology, Tokyo, Japan, Sept. 1988, "Matrix Cracking in Uniaxially Reinforced Ceramic Matrix Composites".
1. NATO Advanced Study Institute on the Science and Technology of Fast Ion Conductors, Erice, Italy July 1-15, 1987, "Degradation of Ceramics in Alkali Metal Environments".

Presentations and Posters: (person presenting is in bold letters) This section has not been updated since 2009.

MS&T, Fall 2009 Meeting, Pittsburgh, PA. Direct Observation of Acousto-Elastic Hysteresis in Kinking Nonlinear Elastic Solids: **P. Finkel**, O. Yeheskel, M. W. Barsoum

MS&T, Fall 2009 Meeting, Pittsburgh, PA. Electronic, Elastic and Thermal Properties of Ti_2AlC , Ti_3AlC_2 , $Ti_3Al(C_{0.5},N_{0.5})_2$, $Ti_2Al(C_{0.5},N_{0.5})$ and Ti_2AlN : T. Scabarozzi, M. Radovic, B. Manoun, J. Hettinger, S. Lofland, S. Amini, P. Finkel, & **M. W. Barsoum**.

MS&T, Fall 2009 Meeting, Pittsburgh, PA. "Thermal Stability and Effect of Texture on Ultrahigh Damping of Nanocrystalline Mg-Matrix Composites Reinforced with MAX Phases," **S. Amini**, M.W. Barsoum, A. R. McGhie, C. Ni, M. Odén, S. Vogel and D. Brown.

MS&T, Fall 2009 Meeting, Pittsburgh, PA "Mechanical Properties and Kinking Non-Linear Elasticity of Fully Dense Ti_2SC and Cr_2GeC ", S. Amini and **M. W. Barsoum**

MS&T, Fall 2009 Meeting, Pittsburgh, PA "Thermal Expansion of Select MAX Phases Measured by High Temperature X-ray Diffraction and Dilatometry", T. Scabarozzi, S. Amini, O. Leaffer, A. Ganguly, S. Gupta, W. Tambussi, S Clipper, J. Spanier and M. W. Barsoum.

MS&T, Fall 2009 Meeting, Pittsburgh, PA, Electron-Backscattered Diffraction and Transmission Electron Microscopy Microstructural Study of Post-Crept Ti_3SiC_2 : F. Barcelo, S. Doriot, T. Cozzika, M. Le Flem, J. Béchade, **M. Radovic**; M. W. Barsoum.

MS&T, Fall 2009 Meeting, Pittsburgh, PA, The MAX Phases and Kinking Non-Linear Elastic Solids a Newly Identified Class of Solids: **M. W. Barsoum**

MS&T, Fall 2009 Meeting, Pittsburgh, PA, Reactivity of Ti_2AlC with SiC Fibers and Powders up to Temperatures of $1550^\circ C$, C. Spencer, J. Córdoba, E. Judd-Sierra, N. Obando, **M. Radovic**, M. Odén, L. Hultman, and M. W. Barsoum.

MS&T, Fall 2009 Meeting, Pittsburgh, PA, On the Reactivity of Ti_2AlC with Al_2O_3 Fibers, C. Spencer, J. Córdoba, N. Obando, **M. Radovic**, M. Odén, L. Hultman and M. W. Barsoum

On The Spherical Nanoindentation Stress-Strain Curves, Effective Zero Point, And Their Applications, **S. Basu**, A. Moseson and M. W. Barsoum, Workshop on in-situ methods in nanomechanics, Lawrence Berkeley National Laboratory, Aug. 2007, Berkeley, CA. **Poster**

On The Determination Of Spherical Nanoindentation Stress-Strain Curves, Surface Zero Point, And Their Applications, S. Basu, A. Moseson & M. W. Barsoum, MRS Fall Meet., Nov. 2007, Boston, MA. **Poster**

Spherical Nanoindentation Stress-Strain Analysis and Applications, **S. Basu** and M. W. Barsoum, Frontiers in Mechanical Engineering 2008: Nanomechanical Engineering, University of Pennsylvania, May 2008, Philadelphia, PA. **Poster**.

107th Annual Meeting American Ceramic Society, April, 2005, Baltimore, MD, "Joining of $M_{n+1}AX_n$ Phases at Elevated Temperatures", **A. Ganguly**, M. W. Barsoum and R. D. Doherty.

107th Annual Meeting American Cer. Soc., April, 2005, Baltimore, MD, "Low Temp. Elastic and Electronic Properties of $Ti_3Si_{1-x}(Ge/Al)_xC_2$ and $Ti_2AlC_yN_{(1-y)}$ Solid Solutions", **A. Ganguly**, M. W. Barsoum, P. Finkel, J. Hettinger, S. Lofland, K. Harrell, Z. Sun, S. Ali & R. Ahuja.

107th Annual Meeting of the American Ceramic Society, Apr. 10-13, 2005, Baltimore, MD, "Theory of Kinking Nonlinear Elastic Solids", **A. Zhou**, M. W. Barsoum, T. Zhen, Z. M. Sun, S. R. Kalidindi

ECS: 207th Meeting "Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes", Oral Pres. **J. Chmiola**, G. Yushin, R. Dash, E. Hoffman, J. Fischer, M. W. Barsoum and Y. Gogotsi.

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, "Tribological Properties of MAX phase", with **S. Gupta**, Z. M. Sun, A. Ganguly, T. Palanisamy, E. Passman & C. W. Li

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, Synthesis and Consolidation of Single-Phase Ternary Compound Ti_3SiC_2 via Pulse Discharge Sintering (PDS), with **Z. M. Sun**, M. W. Barsoum, H. Hashimoto, and Z. F. Zhang. (Poster).

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, "Mechanical and Damping Properties of Porous Ti_3SiC_2 ", with **Z. M. Sun**, A. Zhou, T. Zhen, A. Murugaiah, M. W. Barsoum and T. El-Raghy.

29th Inter. Conf. on Advanced Ceramics and Composites, Amer. Ceram. Soc., Jan 23-28, 2005, Cocoa Beach, FL, "Nanoindentations in Ceramic Single Crystals", **S. Basu**, A. Murugaiah, Z. Sun, S. R. Kalidindi and M. W. Barsoum.

29th Inter. Conf. on Advanced Ceramics and Composites, Ceramic Society, Jan 23-28, 2005, Cocoa Beach, FL, "Nanoindentations in Sapphire Single Crystals", **S. Basu**, A. Murugaiah, Z. Sun, S. R. Kalidindi and M. W. Barsoum.

MRS Meeting Fall 2004, "First Order Raman Scattering from MAX Phases", Oral Presentation: **J. S. Spanier**, S. Gupta and M. W. Barsoum.

MRS Meeting Fall 2004, "Effect of Al additions on the synthesis of single-phase Ti_3SiC_2 " Poster with **Z. M. Sun**, S. L. Yang, H. Hashimoto and M. W. Barsoum

MRS Meeting Fall 2004, "Growth Model and Observations of Soft Metal Whiskers", Oral Presentation : **E. N. Hoffman**, M. W. Barsoum, R. D. Doherty, and A. Zavaliangos.

MRS Meeting Fall 2004, "Ductile Machinable Ternary Carbides and Nitrides: A New Class of Solids", M. W. Barsoum.

MRS Meeting Fall 2004, "Tribological and Wear Studies of MAX Phases and Its Composites", Oral Presentation: **S. Gupta**, Z. M. Sun, M. W. Barsoum, T. Palanisamy, E. Passman and C. W. Li.

MRS Meeting Fall 2004, "Kinking Nonlinear Elastic Solids & Spherical Nanoindentations", Oral Presentation, **M. W. Barsoum**, A. Murugaiah, T. Zhen, S. Basu and S. R. Kalidindi.

MRS Meeting Fall 2004, "Spherical Nanoindentations in Mica, Graphite and Sapphire", Oral Presentation: **S. Basu**, A. Murugaiah, M. W. Barsoum, Z. M. Sun, S. R. Kalidindi and Y. Gogotsi.

ECS, 203rd Meeting, Paris, France. "Synthesis and Oxidation of Cr_2AlC and V_2AlC in Air", by S. Gupta and **M. W. Barsoum**,

ECS, 203rd Meeting, Paris, France. "Oxidation of $Ti_{n+1}AlX_n$ where $n = 1-3$ and X is C and/or N", by **M. W. Barsoum**, N. Tzenov, A. Procopio, T. El-Raghy and M. Ali

ECS, 203rd Meeting, Paris, France. "Long Time Oxidation Study Of Ti_3SiC_2 , Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites in Air, by **M. W. Barsoum**, L. H. Ho-Duc, M. Radovic and T. El-Raghy.

ACers, 105th Annual Meeting, Nashville, TN, "Nanoindentation of a Natural Nanolaminate Material: Ti_3SiC_2 ", by **A. Murugaiah**, M. W. Barsoum, S. R. Kalidindi, T. Zhen and Y. Gogotsi.

ACers, 105th Annual Meeting, Nashville, TN, "Synthesis and Oxidation Kinetics of Cr_2AlC in Air", by **S. Gupta** and M. W. Barsoum.

ACers, 105th Annual Meeting, Nashville, TN, "Synthesis and Oxidation kinetics of V_2AlC and $(Ti,V)_2AlC$ in Air", by **S. Gupta** and M. W. Barsoum.

ACers, 105th Annual Meeting, Nashville, TN, "The 1300 °C Isothermal Sections in the Nb-Sn-C and Ti-In-C Ternary Phase Diagrams", by **A. Ganguly**, M. Barsoum and F. Aldinger.

ACers, 105th Annual Meeting, Nashville, TN, "Nanolaminates, Kink Bands and Fully Reversible Dislocation-Based Deformation Up to 1 GPa in Ti_3SiC_2 ", by **T. Zhen**, M. W. Barsoum, S. Kalidindi, M. Radovic and A. Murugaiah

MRS Meeting Spring 2003, "Fully Reversible Dislocation-Based Deformation in a Nanolayered Carbide: Ti_3SiC_2 ", by **M. Barsoum**, T. Zhen, S. Kalidindi and A. Murugaiah.

MRS Meeting Spring 2003, "Deformation Processes During Nanoindentation of Ti_3SiC_2 ", Poster with A. Murugaiah, **M. W. Barsoum**, S. Kalidindi, and T. Zhen.

MRS Meeting Spring 2003, "Dual Tribological Behavior of a Nanolayered Ceramic: Ti_3SiC_2 ", Poster with **A. Souchet**, J. Fontaine, M. Belin, T. Le Mogne, J-L. Loubet and M. W. Barsoum.

SMEC Conf., Florida International University, March 2003, Miami, FL, "Nanoindentation of A Natural Nanolaminate: Ti_3SiC_2 M. W. Barsoum, A. Murugaiah, S. R. Kalidindi, T. Zhen and Y. Gogotsi.

APS March Meeting, Texas, 2003. "Low Temperature Transport Properties of the Natural Nanolaminates: Ti_3AlC_2 and Ti_4AlN_3 ", with P. **Finkel**, J.D. Hettinger, S.E. Lofland.

APS March Meeting, Texas, 2003, "Low Temperature Electrical and Thermal Transport Properties of the Natural Nanolaminate V_2AlC ". With J. D. Hettinger, P. **Finkel**, S. E. Lofland and S. Gupta.

Gordon Research Conference, Aug. 2001, "Deformation and Rupture of Ti_3SiC_2 During Tensile Creep in the 1000-1200°C Temperature Range", Poster with **M. Radovic**, T. El-Raghy and S. Wiederhorn

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, "Compression Creep Behavior of Ti_3SiC_2 in the 1000-1200 °C Temperature Range" with **T. El-Raghy**, B. Tiberio, A. Zavaliangos.

Centennial Meeting of APS, March 20-26, Atlanta GA, "Temperature Dependence of the Elastic Properties of Ti_3SiC_2 ", Bulletin of American Physical Society, **44**, No.2, 1999, with **P. Finkel** and T. El-Raghy.

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, "Thermal Properties of Ti_3SiC_2 ", with T. El-Raghy, C. Rawn, A. Payzant and C. Hubbard.

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, "Room Temperature Ductile Carbides", with T. El-Raghy

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Effect of Micro-structure on Room and Elevated Temperature Mechanical Properties of Ti_3SiC_2 " with T. El-Raghy. C-005-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Surface Treatment of Ti_3SiC_2 ", with T. El-Raghy. C-006-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Oxidation of Ti_3SiC_2 in Air", with T. El-Raghy and L. Ogbuji. C-007-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Polycrystalline Nanolaminates", with T. El-Raghy. C-008-97.

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, FL., "Polycrystalline Nanolaminates, Ti_3SiC_2 , Ti_3GeC_2 & the H-phases", with T. El-Raghy

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, FL., "Reaction Path and Microstructure-Property Relationships in Ti_3SiC_2 ", with T. El-Raghy

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, FL., "Functionally Graded Ti_3SiC_2 Materials", with T. El-Raghy

1996 MRS Fall Meeting, Dec. 2-6, Boston, MA, "Polycrystalline Nanolaminates, Ti_3SiC_2 , Ti_3GeC_2 & the H-phases", with T. El-Raghy. V10.10

1996 MRS Fall Meeting, Dec. 2-6, 1996, Boston, MA, "Effect of Interplanar Debonding on the Properties of Ti_3SiC_2 and the H-phases", with T. El-Raghy. W12.10

98th Annual Meeting of the Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, " Ti_3SiC_2 & Other Truly Remarkable Ceramics", with T. El-Raghy.

98th Annual Meeting of the Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, "Transient Plastic Phase Processing of Ceramic/Ceramic Composites and their Properties", with A. Zavaliangos, S. Kalidindi and D. Brodtkin

98th Annual Meeting of Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, "Processing of Fully Dense Single Phase Ti_3SiC_2 and Ti_3SiC_2 -TiC Composites", with T. El-Raghy.

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN, "A Novel Technique to Measure Axial Thermal Residual Strains and Critical Lengths of Ceramic Fibers and Whiskers", with A. Elkind. SII-78-93.

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN., "Transient Plastic Phase Processing of Ultra-Refractory Composites".

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN., "Role of Oxynitride Formation During Nitridation of Si Powders in Nitrogen", with T. Parker. SX-10-93

1992 MRS Fall Meeting, "Thermodynamics and Kinetics of Nitridation of Si Powders in Nitrogen", with T. Parker, K2.4.

1992 World Metallurgy World Congress, June 21-26, San Francisco, CA "Formation of TiC and TiB_2 Composites",

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN, "Low Voltage-High Current Density ZnO Varistors", with A. Elkind and F. Selim. 16-E-92.

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN, "Matrix Cracking in Uniaxially Fiber-Reinforced Ceramic Matrix Composites:, Part I. Effect of Matrices", with P. Kangutkar and A. S. D. Wang. 38-SII-92.

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN., "Matrix Cracking in Uniaxially Fiber-Reinforced Ceramic Matrix Composites:, Part II. Effect of Fiber diameter, Residual Stresses and Interfacial Bonding", with P. Kangutkar & A. S. D. Wang.

93rd Annual Meeting of Amer. Cer. Soc., April 28-May 2, 1991, Cincinnati, OH, "Reduction Kinetics of Lead Silicate Based Glasses", with S. Kumar, A. Then and W. Tasker.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH, "Effect of Temperature and Environment on the Interfacial Shear Strengths Between SiC and Glass" with I. Tung and H.M. Chou.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH., "Reactive Sintering and Forging of In Situ Formed, Fully Dense TiB_2 /TiC Composites", with B. Houg and R. Sands.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH., "Matrix Cracking in Fiber-Reinforced Ceramic Matrix Composites", with P. Kangutkar.

7th CIMTEC World Congress, Montecatini, Italy, June 1990. "Matrix Cracking Stresses in Uniaxially Fiber Reinforced Ceramic Matrix Composites", with P. Kangutkar & A. S. Wang.

92nd Annual Meeting of the American Ceramic Society, April 22-26, 1990, Dallas, TX., "Effect of Temperature and Fabrication Environments on Interfacial Shear Strengths in SiC Fiber-Glass Composites", with F. Ardite and H. Chou (62-SIV-90)

91th Annual Meeting of the American Ceramic Society, May 1-5, 1989, Indianapolis, In., "Matrix Cracking Stresses in Uniaxially Fiber Reinforced Ceramic Composites", (71-SI-89)

13th Annual Conference on Composites and Advanced Ceramics, Jan. 15-18, 1989. Cocoa Beach, Fl., "Reaction Mechanisms During Nitridation of Silicon Powder", with P. Kangutkar & M.J. Koczak. (38-C-89F).

4th Annual Northeast Meeting, Processing and Applications of High Tc Superconductors: Status and Prospects, May 9-11, Rutgers University, New Brunswick, NJ. Co-sponsors Met. Soc., MRS and ASM. "Effect of Magnetic field on Separation and Classification of Superconducting Powders", with S. Tyagi.

90th Annual Meeting of the American Ceramic Society, May 1-5, 1988, Cincinnati, OH., "Lithium Ceramic Interactions", with B. Bae. (217-B-88)

90th Annual Meeting of the American Ceramic Society, May 1-5, 1988, Cincinnati, OH "Microcracking in Ceramic Composites", with S. Holder and S. Freiman. (26-C-88)

90th Annual Meeting of the Amer. Ceram. Soc., May 1988, Cincinnati, OH, "Use of the Meissner Effect to Separate, Purify and Classify Superconducting Powders", with D. Patten and S. Tyagi. (68-SII-88).

89th Annual Meeting of the American Ceramic Society, April 30, 1987, Pittsburg, PA., "Microcracking in Ceramic/Ceramic Composites", with Z. Zhou. (49-C-87)

171st Meeting of the Electrochemical Society, May 10-15, 1987. Philadelphia, Pa. "Thermodynamics and Kinetics of Li/Ceramic Interactions", with K. Pytlewski.

5th International Conf. on Solid State Ionics, Aug. 18-24, 1985, Lake Tahoe, CA. "In Situ Determination of the Reactions Between Li and Fast Ion Conducting Glasses", with H. Tuller.

TEACHING

Undergraduate:

- E-848 Fundamentals of Ceramics
- E-880 Electronic Properties of Materials
- E-801 Fundamentals of Materials
- E-831 Thermodynamics of Materials Processing

Graduate:

- G-823 Structure and Properties of Ceramics and Electronic Materials

G-880 Special Topics: "Modern Electrochemistry"
G-880 Special Topics: "Processing of High Performance Ceramics".
G-880 Special Topics: "Structure and Properties of Ceramics, Part II."
G-580 Introduction to Solid State Materials.
G 580 Special Topics: "Materials for High Temperature and Energy Applications".

PUBLIC SERVICE

Participated NSF sponsored workshop: Fundamental Research Needs in Ceramics, held in Arlington, D.C. on June 10-11, 1997.

Committee Membership

Phase Equilibria Program, Amer. Cer. Soc., 1997-2000.

Peer Reviewer

Journals: Nature, J. Amer. Cer. Soc., J. Europ. Cer. Soc., Materials Science and Engin., J. Applied Physics, Applied Physics Letters, Acta and Scripta Mater., Tribological Letters., Phys. Rev. B., Small, Nature, Science.

Proposals: National Science Foundation, STCU.

STUDENTS SUPERVISED

PhD: **Highlighted entries are currently in academia.**

1. P. Kangutkar, (1991) "Matrix Fracture Mechanisms in Fiber Reinforced Ceramic Composites".
2. S. Kumar, (1994) "Reduction Kinetics and Electrical Conductivity in Lead-Disilicate Glasses".
3. D. Brodtkin, (1996) "Transient Plastic Phase Processing of Ti-B-C Composites & their Properties".
4. T. El Raghy, (1997) "Processing and Characterization of Ti_3SiC_2 ", with A. Zavaliangos and S. Kalidindi.
5. C. Wilkinson Mager, (2000) "Development of a Zirconium Toughened Hydroxyapatite", with L. Shadler.
6. **M. Radovic, (2001) "Effect of Temperature and Microstructure of Tensile and Tensile Creep Properties of Ti_3SiC_2 in Air". With T. El-Raghy. Texas A&M**
7. P. Finkel, (2003) "Low Temperature Elastic and Electronic Properties of MAX Phases".
8. A. Murugaiah, (2004) "Nanoindentations in Kinking Nonlinear Elastic Solids", with S. Kalidindi.
9. T. Zhen, (2004) "Compressive Behavior of Kinking Nonlinear Elastic Solids - Ti_3SiC_2 , Graphite, Mica and BN", with S. Kalidindi.
10. A. Ganguly, 2006, "Synthesis and Characterization of MAX Phase Solid Solutions".
11. **S. Gupta, (2006) "Tribology of MAX Phases and Their Composites". North Dakota Stat**
12. E. Hoffman, (2006) "Carbide Derived Carbon from MAX-Phases and their Separation Applications", with Y. Gogotsi.
13. S. Basu, (2008) "On Spherical Nanoindentation Stress-Strain Curves, Creep and Kinking Nonlinear Elasticity in Brittle, Hexagonal Single Crystals", with S. Kalidindi.
14. **A. Zhou, (2008) "Kinking Nonlinear Elastic Solids: Theory and Experiments", with S. Kalidindi. Henan University, Henan, China.**

15. S. Amini, (2009) "On the Effect of Texture on Kinking Non-Linear Elasticity of MAX Phases and MAX-Reinforced Mg Matrix Composites"
16. A. R. Sakulich, (2009) "Mechanical and Chemical Characterization of Alternative Cements and Ancient Building Materials." Worcester Polytechnic Institute, Worcester, PA.
17. T. Scabarozi, (2009) "Combinatorial Investigation of MAX Phases Ternary Carbide Thin Films."
18. A. Moseson, (2011) "Design and Implementation of Alkali Activated Cement For Sustainable Development"
19. N. Lane (2013) "Lattice Dynamical Studies of Select MAX Phases", (with J. Rondinelli).
20. M. Naguib, (2014) "MXenes: A New Family of Two-Dimensional Materials and its Application as Electrodes for Li-ion Batteries", (with Y. Gogotsi)
21. B. Anasori, (2014) "Mg/MAX Composites: Characterization and Properties".
22. O. Mashtalir, (2015) "Chemistry of 2D Transition Metal Carbides (MXenes) (with Y. Gogotsi).
23. M. Shamma, (2015) "On Buckling, Kink Boundaries and Kinking Nonlinear Elastic Solids"
24. J. Griggs, (2016) "Investigation of the Reversible Hysteresis Effect in Hexagonal Metal Single Crystals and the MAX Phases", (with Mitra Taheri).
25. D. Tallman, (2016) "On the Potential of the MAX Phases for Neutron Applications"
26. M. Lukatskaya, (2016) "Capacitive Performance of 2D Metal Carbides", (with Y. Gogotsi).
27. J. Halim, (2016) "An X-Ray Photoelectron Spectroscopy Study of Multilayered Transition Metal Carbides (MXenes)", (with Johanna Rosen, Linkoping University, Linkoping, Sweden)
28. M. Ghidui, (2017) "Ions in MXene: Characterization and Control of Interlayer Cations and their Effects on Structure and Properties of 2D Transition Metal Carbides".
29. S. Kota, (2019) The MoAlB Phases
30. V. Natu, (2020) MXenes and their properties
31. M. Carey, (2021) Polymer/MXene composites
32. H. Badr, Ripplations
33. T. El-Melegy, High temperature properties of the MAX phases

MASTERS

1. 1988 B. Bae, "Interactions of Lithium with Lithium Borates".
2. 1989 P. Kangutkar, "Processing of Reaction Bonded Silicon Nitride", with M. Koczak.
3. 1990 J. Medoff, "Processing/Property Relationships in $Y_1Ba_2Cu_3O_{7-x}$ ".
4. 1990 S. Liou, "Ceramic Thermal Barrier Coatings on Graphite Epoxy Composites", with R. Smith
5. 1991 B. Houng, "Transient Plastic Phase Processing of Ti-B-C Composites".
6. 1992 T. Lien, "ZrC/ZrB₂ Composites Processed by Reaction Hot Pressing"
7. 1993 T. Parker, "Thermodynamics and Kinetics of the Nitridation of Si Powders in N₂"
8. 1993 P. Ciccone, "The Design and Fabrication of Sudragon IV".
9. 1998 S. Chakraborty, "Processing and Characterization of Some H-phases", with T. El-Raghy.

10. 1999 M. Ali, "Processing and Characterization of Ti_2AlC , $Ti_2AlC_{0.5}N_{0.5}$ and Ti_2AlN ", with T. El-Raghy
11. 1999 A. Procopio, "Synthesis and Characterization of Ti_4AlN_3 ", with T. El-Raghy.
12. 2001 I. Salama, "Synthesis and Characterization of the Ternary Carbides Nb_2AlC and $(Ti,Nb)_2AlC$ " with T. El-Raghy.
13. 2002 J. Travaglini, "Corrosion Behavior of Ti_3SiC_2 "
14. 2002 L. Ho-Duc, "Synthesis and Characterization of the Properties of Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites".
15. 2007 A. Moseson, "Spherical Nanoindentation: Insights and Improvements, Including Stress-Strain Curves and Effective Zero Point Determination".
16. 2009 J. Lloyd, "Investigation of the Ternary Carbides Nb_2PC and Mo_2BC "
17. 2010 I. Albaryak, "Mechanical Properties of Polycrystalline Ceramics as Determined by Nanoindentation Methods: Effect of Surface Roughness and Tip Size"
18. 2010 C. J. Spencer, "Fiber-Reinforced Ti_3SiC_2 and Ti_2AlC MAX Phase Composites"
19. 2014 M. Nelson, " Cr_2AlC and Ti_3SiC_2/Mg composites: Fabrication and Properties"
20. 2015 M. Agne, "The Stability of Ti_2AlC and V_2AlC with Al, and the Synthesis of Composites in the Al-Ti-B-C and Al-V-C systems".
21. 2016 G. Bentzel, No thesis option.
22. 2017. E. Mayerberger, No thesis option.
23. 2018. C. Voigt, "Anion Adsorption and clay-like swelling of $Ti_3C_2T_z$ MXene multilayers"