

## Krassimir Marchev, Ph.D.

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### Objective:

Utilize my strong academic background, extensive experience and technical knowledge acquired in advanced industrial organizations to lead cutting edge research and development programs and initiatives. Develop and introduce universal challenge-based curriculum for advanced on-campus, on-site and on-line technical training of employees and students.

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### Experience:

Northeastern University, NEU

July 2017 – present

#### Professor of the Practice

#### Lead | Director | Advanced Manufacturing and Engineering Technology Programs.

- Lead the development of the BS in Advanced Manufacturing, BSAMS program and its implementation on site at the industrial partners' locations such as General Electric. Leads the restructured online BSAMS program.
- Lead the restructuring of the College of Professional Studies, CPS engineering programs and the development of the new BS in Mechatronics program and the Certificate in Advanced Manufacturing Systems.
- Coordinates the CPS engineering programs and activities with other NEU colleges
- Teaches broad range of Advanced manufacturing courses. Provided advanced engineering training on-site at the GE facilities using innovative challenge-based format. Teaches online and in traditional classroom settings.
- Coordinated the expansion of the Advanced Manufacturing and the Mechanical engineering technology programs to the Springfield Community College in Springfield, MA.
- Leads the technical evaluation of potential Industrial and Community college partners in other states – North Carolina, New Hampshire, and Washington State.
- Manages the teaching and curriculum activities of Engineering faculty members at CPS
- Serves as a member of the Professional Standing Committee at CPS
- Serves as a member of the International Advisory Committee on the NSF funded project on *Training an Agile, Adaptive Workforce for Future of Manufacturing with Intelligent Augmented Reality (IAR)*
- Established Industrial Advisory Board in Advanced Manufacturing at CPS, which includes senior executives from leading US organizations. Manages the board schedule, semi-annual meetings and activities.

**OptoGlo Inc.****Feb. 2016 – June 2017****Vice-President and Chief Operating Officer**

- Lead the OptoGlo innovation, new product development, and employee training programs.
- Established overseas manufacturing operations in Shenzhen, China, manages the multi-disciplinary team and the launch of two new products in Q2/Q3 2017.
- Lead the NanoDef™ initiative of OptoGlo Inc. – program for transparent active and passive displays based on innovative printing nano-technologies. Generated significant IP and partnerships with major clients.
- Developed external network of academic and industrial resources, which accelerated significantly the research and product development programs.

**Milara Inc., Milford, MA -****Sept. 2012 - Jan.2016****Director Advanced Materials, Engineering and Innovations**

- Lead the development and the implementation of company's innovation strategy.
- Developed and introduced new program for Materials engineering, including design, surface engineering, characterization, failure analyses, and training of engineering and supply chain staff.
- Initiated and implemented new system for unified technical training and education of all US-based and overseas employees of Milara Inc.
- Lead the initiative to establish the Center of Robotics and Automation at the Technical University of Sofia, Bulgaria. Facility fully operational since February 2014. Organized and lead web training and educational courses for faculty and graduate students using US lecturers.
- Lead and managed the engineering development of the first robotic system for 3D nano-printing of electronic sensors and devices with 20 nm resolution NanoOPS – a joint project with the NSF Center for High-rate Nano-manufacturing, Boston, MA. Officially opened at the center for Homeland security, of NEU in Burlington, MA, Sept. 17, 2014. NanoOPS has been recognized as one of the top technologies for 2015 by the UK edition of Wired Magazine, December 2014
- As a member of the three-man senior management team, played a key role the acquisition process and the transition of Equipe vacuum robots from Brooks Automation to Milara Inc.
- Coordinated and managed Milara strategic accounts: Teradyne, KLA-Tencor, AMAT and Rudolph Technologies.
- Lead a multi-million dollar project for a tier 1 client, whose primary objective was to develop novel advanced robotic system for testing of hard drives. Managed and coordinated the extensive international participation and resource utilization. Robotic systems of the new generation - installed and fully operational in South Eastern Asia.

**NSF Center for High-Rate Nano-manufacturing (CHN), Boston, MA  
Co-chair of the Industrial Advisory Board (IAB)****2013-2017**

- Working with fellow senior executives, members of the IAB, to identify ground-breaking opportunities in the field of nano-technology and nano-manufacturing including key strategic partnerships.
- Provide guidance to the CHN academic, technical and management staff to secure scientific, technical and marked superiority.

**P&G – The Gillette company, Boston, MA**

**2000-Aug. 2012**

**Technical team leader, Senior Scientist / Engineer, Senior technologist Blades and Razors**

Method Development and Operations organization (MDO)	2011-2012
Gillette Shaving Technology Laboratory (STL)	2008-2011
Gillette Advanced Technology Center of US (GATCUS)	2002-2008
Boston Research and Development Center (BRAD)	2000-2002

Major Accomplishments: Led the development of the blade edge for “Gillette Fusion ProGlide” razor, which became a Billion dollar product of Procter and Gamble and is still the best performing blade edge in the world.

Leadership, major technical and theoretical contributions:

- *Major educational and training* contribution: Lead the Blade edge, Instrumentation and Materials engineering global training at the Internal Gillette Technical University. Developed curriculum and delivered lectures and seminars to technical and engineering staff and to product researchers and marketing.
- As Radiation Safety Officer for the South Boston facility of P&G lead the annual training and certification to technical and engineering staff.
- *Major theoretical* contribution: Developed the structural model of Gillette razor blade edges.
- *Major product development* contributions: novel steel substrate, new generation of advanced hard coatings for blade edges, antibacterial and corrosion protection. Patented and implemented in FusionProGlide blades and in other edges.
- *Major methods development* contribution: Developed novel methods for stress measurements in steels using X-ray diffraction, edge damage characterization, failure analyses of blades.
- Monitored, identified, explored, and developed related novel materials, technologies, and analytical characterization with potential benefit to the company and the organization.
- Developed and established extensive network of technical resources using external C+D (connect and develop) resources including local, US-based, European-based, academic and industrial partners. Utilized these for development of novel technologies, materials, product evaluation and cost savings.
- Worked on a collaborative basis with international, interdepartmental leaders to bring a cohesive nature to the product development/product improvement process. Provided support to other divisions and organizations (Duracell, OralB, Braun, BabyCare), which resulted in significant products and process improvements, and cost savings.

- Coordinated blade-related project activities on the ProGlide with the UK-based R&D organization of Gillette - The Reading Innovation Center.
- Lead the development of the Technical Product Story, TPS, for novel blade edges and materials
- Lead product testing and consumer evaluation of the novel blade edges of Fusion ProGlide.
- Provides scientific, technical and analytical support to Legal department to address on-going legal issues and litigations.

**Northeastern University, Boston, MA**

**1991-2017**

**Part-time faculty member**, College of Professional Studies

Taught broad range of courses both on campus and on-line in Chemistry, Chemical Principles, Kinetics, Environmental Chemistry, Materials Science, Advanced Inorganic Chem-3 as well as labs including Chemistry-1,2, and 3.

**Technical University of Sofia, BULGARIA**

**October 2014-present**

**Visiting Professor**, Department of Materials Science and Technology

Presents lectures on Advanced Materials Engineering, Nano-technologies, Engineering and Innovation management. Advises faculty members on novel technologies, teaching innovations and entrepreneurship.

**Bulgarian Sunday School, Boston, MA**

**2007-2020**

**Member of the Board of Directors**

Teaches comprehensive course on Chemistry, Engineering and New Technologies for high school students.

**Cellutech LLC**

**1996-2001**

Co-founder, Senior Manager - Department of Testing and Standardization (1996-1998)

Company specialized in novel technology development based on non-traditional approaches and disruptive innovation. Primary target areas: wood, pulp, paper, and related industries based on product applications.

**Norton Diamond Film, Saint-Gobain Corporation, Northboro, MA**

**1998-2000**

Senior Engineer-Developed novel pretreatment process for WC-based materials for deposition of pure diamonds on end-mills for the Japanese market

**Northeastern University**

**1994-1998**

Staff Scientist, Barnett Institute of Chemical Analysis and Materials Science

- Lead joint project with the United Technology Research Center, Hartford, CT
  - Developed new coatings for AerMet 100-based on Plasma nitriding - *two patents issued*
- Developed new Amorphous Metal Alloy Rich in Noble Metals by Rapid Solidification Processing
  - *Patent # 5,593,514 granted January 14, 1997*

- Co-advised 3 Ph.D . and 2 M.S Students

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## Education

**Northeastern University, Boston, MA** **1994**

Interdisciplinary Ph.D. in Solid State Chemistry and Materials Science

Thesis: Processing, characterization and kinetics of plasma nitrided stainless steels

Advisor: Prof. Bill Giessen

**MIT - Sloan School of Management, Cambridge, MA** **2014-2017**

Completed executive programs:

- Building, Leading and Sustaining Innovative Organizations
- Developing and Managing Successful Technology and Product Strategy

Executive Certification in Innovation management.

**Warsaw Technical University, Warsaw, Poland** **1984**

MS in Materials Science and Engineering

Thesis: Preparation and Thermal Analysis of Cu-Ni-Zr metallic glasses

Advisor: Prof. Henryk Matyja

Graduated with Golden medal and Honors from the Bulgarian Ministry of Education

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## Professional activities and organizations

- **American Society of Metals, ASM International**
  - **Member National ASM Advanced Manufacturing Committee** **2022-present**
  - **Member National ASM Emerging Technologies Awareness Committee** **2022-present**
  - **Chair of Executive Board, ASM Boston chapter** **2022-present**
  - **Vice-chair of Executive Board, ASM Boston chapter** **2020-2021**
  - **Nominated for a Fellow of the ASM International, *in process*** **2021**
- **National Science Foundation, NSF, Washington, DC** **2006-2016**  
Technical expert and panelist, Materials Design and Surface Engineering Directorate
- Served as a member of the Global Semiconductor Industry organization, SEMI *Industry Image and Awareness* exploratory panel, Jan. 2021.
- Member of ASM, MRS, AVS
- Editor of 6 volumes of Metallurgical Coatings and Thin Films special proceedings, also published in Thin Solid Films and in Surface and Coatings Technology by Elsevier scientific.
- Member of the Executive board and Session chair at ICMCTF – numerous times since 1993
- Member of the International Scientific committee Asian-European conference on Plasma Surface Engineering since 1998
- Presented seminar on Plasma Surface Eng. at Toyota Motor R&D Center, Aichi Nagoya, Japan.

- Plenary speaker – Technical University of Sofia 70<sup>th</sup> Anniversary symposium
  - Member International Programing committee, Conference “High Technologies, Busines, Society, Borovets, Bulgaria”, March 13-17, 2017
  - Invited speaker – Advanced X-ray Analysis - ASM Annual meeting, Pittsburgh, PA.
  - President of the Alpha Nu Chapter of the Phi Beta Delta Honor Society of International Scholars at Northeastern University - founder and chapter chair 1995-98
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### Interests and Hobbies

- Flying - Private pilot since 1998.
  - Soccer - Coached kids U8-U12 at Wayland Youth Soccer and Sudbury Youth soccer
  - Language proficiency: - Fluent in English, Bulgarian, Polish, Russian;
  - Travel
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### Granted Patents

- **US Patent No: US 9,855,665 Strengthened Razor Blade** – Issues January 2, 2018 to the Gillette Company
- **US Patent No: US 9,598,761 Strengthened Razor Blade** – issues March 21, 2017 to the Gillette company. Patent covers novel plasma surface engineering approach of strengthening razor blade edges based on plasma modification of blade substrates.
- **US Patent No.: US 9,248,579 Razors and razor cartridges** – issued February 2, 2016 to the Gillette company. Patent covers novel cartridge design, based on mixed blade configuration with optimized cutting force for each blade location.
- **US Patent No.: US 9,079,321 “Razor blades”** – issued July 14, 2015 to the Gillette company. Patent covers novel ultra-low cutting force razor blade based on innovative design, substrate material, physical metallurgy, strength reinforcing mechanism.
- **US Patent No.: US 7,977,909 “Process of Forming a Razor Blade”** - Issued June 28, 2011 to the Gillette Company. Patent covers: application of the novel *High Power Impulse Magnetron Sputtering* (HIPIMS) processing to razor blade applications for superior performance and consumer satisfaction.
- **US Patent No.: US 2011.0209988 “Thin Film Coating on Blades”**, Pending, filed September 1, 2011. The Gillette Company; covers the application of the novel high strength hard coating for superior product performance.
- **US Patent No.: US 2010/0011590 “Razors and Razor Cartridges”** Pending, filed January 21, 2010. by the Gillette Company. Covers the cartridge and the blades of Fusion ProGlide – the latest and the most advanced Gillette shaving product
- **US Patent No.: US 2010/0011595 “Razor Blades”** Pending, filed January 21, 2010 filed by the Gillette Company. Covers: The blade edge of Fusion ProGlide
- **US Patent No.: US 7,556,699 “Method for Plasma Nitriding of Metals via Nitrogen Charging”** Issued, July 7, 2009 to the Sikorsky Aircraft Corporation Covers: novel method for plasma processing of for superior performance of specialty alloys

- **US Patent No.: US 7,695,573 “Method for Processing Alloys via Plasma (Ion) Nitriding”** Issued, April 13, 2010 to Sikorsky Aircraft Corporation. Covers: novel method for plasma processing of for superior performance of specialty alloys
- **US Patent No.: US 8,349,093 B2 “Method for Plasma Nitriding of Metals via Nitrogen Charging”, Issued Jan 8, 2013, to Sikorsky Aircraft Corporation.** Covers novel method for plasma processing of for superior performance of specialty alloys.
- **European patent EP 2 435 596 B1 “A Strengthened Razor Blade”** filed by Procter & Gamble London Innovation Centre, Egham UK, published 19.06.2013, Bulletin 2013/25 by the European Patent Office.
- **Bulgarian Patent # 75,249 " Method for Sustaining and Mixing the Melt During the Casting of Amorphous and Fine-crystalline Metal Alloys",** Issued Oct.10, 1986.

#### Recently filed patent applications

- **Systems and Methods for Forming Electronic Devices from Nano Materials** – Filed by Milara Inc. Application No.: 15/269,752, September 19, 2016
- **Strengthening of Razor blades by Plasma Surface Modifications**– Filed May 2017 by Procter and Gamble - The Gillette company

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#### Proceedings

1. **Metallurgical Coatings and Thin Films 2001V1, special edition**– Proceedings of the 28th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 30 - May 2, 2001; Editors: A. Mitterer, A. Pique, Krassimir Marchev, J. Schneider, A. Voevodin; Elsevier Science B.V.; Also printed in Surface and Coating Technology, Vols. 146-147.
2. **Metallurgical Coatings and Thin Films 2001V2, special edition**– Proceedings of the 28th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 30 - May 2, 2001; Editors: A. Mitterer, A. Pique, Krassimir Marchev, J. Schneider, A. Voevodin; Elsevier Science B.V.; Also printed in Thin Solid Films, Vols. 398-399
3. **Metallurgical Coatings and Thin Films 2002V1, special edition**– Proceedings of the 29th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 22 -26, 2002; Editors: B.Sartwell, S. Rohde, W. Ensinger, K. Wahl, Krassimir Marchev; Elsevier Science B.V.; Also printed in Surface and Coating Technology, Vols. 163-164.
4. **Metallurgical Coatings and Thin Films 2002V2, special edition**– Proceedings of the 29th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 22 -26, 2002; Editors: B.Sartwell, S. Rohde, W. Ensinger, K. Wahl, Krassimir Marchev; Elsevier Science B.V.; Also printed in Thin Solid Films, Vols. 420-421
5. **Metallurgical Coatings and Thin Films 2003V1, special edition**– Proceedings of the 30th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 28 – May

2, 2003; Editors: A. Matthews, Krassimir Marchev, J. Patscheider; Elsevier Science B.V.; Also printed in Surface and Coating Technology, Vols. 177-178.

6. **Metallurgical Coatings and Thin Films 2003V2, special edition**– Proceedings of the 30th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA April 28 -May 2, 2003; Editors: A. Matthews, Krassimir Marchev, J. Patscheider; Elsevier Science B.V.; Also printed in Thin Solid Films, Vols. 447-448

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## Publications:

1. "Effect of Non-steady State Nucleation in the Kinetics of Crystallization of the Amorphous Alloy  $Fe_{80}B_{20}$ " S. Budurov, T. Spassov, K. Marchev, *J. Mat. Sci.* 22 (1987) 3485-3490.
2. "Constant Heating Rate Viscosity Measurements of  $Cu_{56}Zr_{44}$  Amorphous Alloy Using Thermomechanical Analyzer", K. Russev and K. Marchev, *Proc. Int. Conf. on Rapidly Quenched Metal Alloys*, Varna, Bulgaria (1987) 114-118.
3. "Isothermal Crystallization Kinetics of  $Cu_{56}Zr_{44}$  Amorphous Alloys", S. Budurov, P. Zielinski, and K. Marchev, *Proc. Int. Conf. on Rapidly Quenched Metal Alloys*, Varna, Bulgaria (1987) 205-209.
4. "Crystallization Kinetics of Amorphous  $Fe_{80}B_{20}$  and Cu-Zr Alloys", S. Budurov, T. Spassov and K. Marchev, *Seminar on Rapid Solidification-Materials Properties-Applications*, Wissenschaftliche Berichte, Nov., 1988, Nr.41, p.196.
5. "Viscosity Measurements at Constant Heat Rate of Amorphous  $Cu_{56}Zr_{44}$  Alloys by Means of the TM Analyzer", K. Russev, L. Stojanova and K. Marchev, *Neue Hutte* 35. Jahrgang Heft 3, Marz 1990.
6. "Biaxial Alignment of High- $T_c$  Superconductor Polycrystals IV: Notes on Processing and Characterization", R. Hidalgo, X.Y. Zhang, S.Q. Wang, K. Marchev, B. Zhang, J.Z. Zhang, F. Chen, R.S. Markiewicz and B.C. Giessen, in "High Temperature Superconducting Compounds III", eds. S. Whang, A. DasGupta and E. Collings, TMS 1991, 89.
7. "Phase Formation, Kinetics and Microhardness of the Nitride Layer in Ion Nitrided 316L Stainless Steel", J.T. Blucher, K. Marchev, S. Gokhale and B.C. Giessen, *at. Res. Soc. Symp. Proc.*, vol. 205 (1992) 269.
8. " $Au_{80}Cu_{10}Y_{10}$ , a Gold-Rich Ternary alloy Glass -with  $T_c > 400^\circ C$  and its Crystallization Kinetics", S. Gokhale, K. Marchev, W. Nowak and B.C. Giessen, *Mat. Res. Soc. Symp. Proc.* Vol. 321, (1994) 639.
9. "Plasma Immersion Ion Implantation Modification of Surface Properties of Polymer Material", I. Husein, Y. Zhou, S. Qin, C. Chan, J. Kleiman, K. Marchev, *Mat. Res. Soc. Symp. Proc.*, vol. 438 (1997) 511.



10. "Observation of Compound Layer with Very Low Friction Coefficient in Ion Nitrided Martensitic 410 Stainless Steel", K. Marchev, C.V. Cooper and B.C. Giessen, *Surface and Coatings Technology* (99)3 (1998)pp.225-228.
11. "Conditions for the Formation of a Martensitic Single-Phase Compound Layer in Ion Nitrided 316L Austenitic Stainless Steel", K. Marchev, C.V. Cooper, J.T. Blucher and B.C. Giessen, *Surface and Coatings Technology*, (99) 3 (1998) pp.229-233.
12. "The Metastable 'm' Phase Layer on Ion Nitrided Austenitic Stainless Steels: Crystal Structure and Observation of Two-Directional Orientational Anisotropy", K. Marchev, R. Hidalgo, M. Landis, R. Vallerio, C.V. Cooper and B.C. Giessen, *Surface and Coatings Technology*, 1-3 (1999) 67-70.
13. "The Use of Intensified Plasma-assisted Processing to Enhance the Surface Properties of Titanium", E.I. Meletis, C.V. Cooper, K. Marchev, *Surface and Coatings Technology*, (113) 3 (1999) pp. 201-209.
14. "The m phase Layer on Ion Nitrided Austenitic Stainless Steel (III): An Epitaxial relationship Between the m-Phase and the  $\gamma$  Parent Phase and a Review of Structural Identifications on This Phase", K. Marchev, M. Landis, R. Vallerio, C.V. Cooper, B.C. Giessen, *Surface and Coatings Technologies*, 116-119 (1999) 184-188.
15. "Intensified plasma-assisted nitriding of AISI 316L stainless steel" Singh, V., Marchev, K., Cooper, C.V., Meletis, E.I., *Surf. Coat. Technol.* **2002**, 160, 249–258.

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**Total number of Citations of publications and patents: 400+**

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