

# ALAN R. PELTON, Ph.D.

## Curriculum Vitae

### Current Position (April 2014-present)

Chief Technical Officer  
G. RAU Inc.  
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### Professional Experience

Nitinol Devices & Components, Inc., 47533 Westinghouse Dr., Fremont, CA 94539  
Chief Technical Officer, 2008-2014  
Nitinol Devices & Components, a Johnson & Johnson Company, 47533 Westinghouse Dr.,  
Fremont, CA 94539  
Distinguished Research Fellow and Director of Materials Research, 2007-2008  
Senior Research Fellow, 2002-2007  
Research Fellow, 1997-2002  
Nitinol Devices & Components, Inc., 48501 Warm Springs Blvd., Fremont, CA, 94539  
Research Director, 1993-1997  
Department of Materials Science and Engineering, University of California, Berkeley, CA  
94720, 510.642.3801  
Research Faculty, 2008  
Lecturer, 2004-2005  
Department of Materials Engineering, California Polytechnic State University, San Luis  
Obispo, CA 93407, Lecturer, 2008, 805.756.2568  
Department of Materials Science and Engineering, Stanford University, Stanford, CA  
94305  
Lecturer, 2007, 2009, 2011 650.725.4034  
Post Doctoral Research Associate, 1982-1983  
Metals Division, Raychem Corporation, 300 Constitution Dr., Menlo Park, CA,  
Technical Manager, 1991-1993  
Research Manager, 1989-1991  
Materials Science and Engineering, University of Notre Dame, Notre Dame, IN,  
Assistant Professor, 1986-1989 574.631.5530  
Materials Science and Engineering Department, Iowa State University, Ames, IA,  
Adjunct Assistant Professor, 1984-1986  
Ames Laboratory, I. S. U., Ames, IA, Associate Metallurgist, 1983-1986.  
515.294.4446

### Education

Ph.D. Materials Science and Engineering, University of California, Berkeley (1982)  
M.S. Metallurgical Engineering, South Dakota School of Mines and Technology (1978)  
B.S. Metallurgical Engineering, South Dakota School of Mines and Technology (1977)

### Professional and Honor Societies

American Society for Metals International  
Editorial Advisory Board, ASM International Shape Memory and Superelasticity  
Journal, 2016-Present  
ASM *Nitinol for Medical Devices* Workshop Organizer/Instructor, 2000-present  
Shape Memory and Superelastic Technologies  
ASM-SMST Board of Directors, 1992-2005, 2015-Present  
ASM-SMST Scholarship Committee, 2015-Present  
ASM-SMST Workshop Organizer, 1994-Present  
SMST Conference Co-Chairman, 2003

SMST Conference Chairman, 2000  
SMST Secretariat, 1997  
SMST Conference Co-Organizer, 1994  
SMST Co-Founder, 1992  
Chair, Structures Committee, 1989-91  
Co-Chair, "Imaging of Materials" Symposium, World Materials Congress, 1988  
Committee Member, Users' Review, National Center of Electron Microscopy, Lawrence Berkeley National Laboratory, 2006-2009  
The Metallurgical Society of AIME  
Chair, Chicago-Section AIME Annual Review of Materials Research Conference, 1987  
Electron Microscopy Society of America  
I. S. U. Electron Microscopy Committee, 1984-1986, Chair, 1986  
Midwest Electron Microscopy Society, Executive Committee, 1987-1989  
Great Lakes Electron Microscopy Affiliates, Executive Committee, 1988-1989

### **Awards**

Fellow, American Society of Materials, International; 2017  
Best Paper Award Honorable Mention for The Shape Memory and Superelasticity Journal Volume 1, "In Situ Neutron Diffraction Studies of Increasing Tension Strains of Superelastic Nitinol" by Alan R. Pelton, Bjørn Clausen, and Aaron P. Stebner; 2015  
Distinguished Alumnus Award, S. D. School of Mines and Technology, 2010  
Honorable Mention for Excellence in Publishing for **Images of Materials**, Association of American Publishers, Inc., 1991  
Outstanding Teacher of the Year Award, College of Engineering, U. Notre Dame, 1989  
Bunshah Award for Best Paper, Inter. Conference on Metallurgical Coatings, 1988  
Outstanding Recent Graduate Award, S. D. School of Mines and Technology, 1987  
Best Paper, Frontiers of Electron Microscopy in Materials Science, 1986  
Best Paper, Eleventh Western Regional Meeting of Electron Microscopists, 1983  
Presidential Scholarship Award, Electron Microscopy Society of America, 1981  
Who's Who in American Colleges and Universities, 1977

### **Academic Services**

Industrial Liaison Committee, Department of Materials Engineering, California Polytechnic State University, 2001-present  
Vice-Chairman, Advisory Council, Department of Biomedical Engineering, University of Alabama, Birmingham, AL, 1997-2006  
Industrial Liaison Committee, Department of Metallurgical Engineering, South Dakota School of Mines and Technology, Rapid City, SD, 1996

### **Patents**

US 6,863,685, "Radiopacity Intraluminal Medical Device", Luis A Davila, Jorge Orlando Mendez, Alan R. Pelton, Karl K. Scheidt, William D. Shaw, Jr., James Silver, Christine Trepanier, and David J. Wilson, March 8, 2005.  
US 7,056,550 "Medical devices, drug coatings and methods for maintaining the drug coatings thereon" L.A Davila, D.C. Lentz, G.H. Llanos; Gerard H. (Stewartville, NJ); J. Mendez, P.V. Narayanan, A.R. Pelton, M.B. Roller, K.K. Scheidt, A.G. Scopelianos, W.D. Shaw, Jr., J.H. Silver; J. Spaltro, C. Trepanier, D.J. Wilson  
US 6,503,271, "Intravascular Device with Improved Radiopacity", Thomas Duerig, Mark Mathis, Alan Pelton, and Dieter Stoeckel, January 7, 2003.  
US 5,843,244, "Shape Memory Alloy Treatment", Alan Pelton and Thomas Duerig, December 1, 1998.

## **Publications**

### **i) Books:**

**Proceedings of Shape Memory and Superelastic Technologies 2003**, edited by A. R. Pelton and T.W. Duerig, SMST, Monterey, CA, 2004.

**Proceedings of Shape Memory and Superelastic Technologies 2000**, edited by S. Russell and A. R. Pelton, SMST, Monterey, CA, 2000.

**Proceedings of Shape Memory and Superelastic Technologies 97**, edited by A.R. Pelton, S. Russell, D. Hodgson, and T. W. Duerig, SMST, Monterey, CA, 1997.

**Proceedings of Shape Memory and Superelastic Technologies 94**, edited by A.R. Pelton, T.W. Duerig and D. Hodgson, SMST, Monterey, CA, 1994.

**Images of Materials**, edited by D. B. Williams, A. R. Pelton and R. Gronsky, Oxford University Press, New York, 1991.

### **ii) Papers**

David J. Bronfenbrenner, Samantha H. Daly, Alan R. Pelton, and Apurva Mehta, "Quantification of Phase Transformations in NiTi with Simultaneous Synchrotron Microdiffraction and DIC", in preparation.

A.R. Pelton, S.M. Pelton, T. Jörn, J. Ulmer, D. Niedermaier, K. Plaskonka, M.R. Mitchell, P. Saffari, W. LePage "The Quest for Fatigue Resistant Nitinol For Medical Implants". Submitted to ASTM TP1616 for the Fourth Symposium on Fatigue and Fracture of Metallic Medical Materials and Devices. May 2018

T.W. Duerig, A.R. Pelton, K. Bhattacharya, "The Measurement and Interpretation of Transformation Temperatures in Nitinol", ASM International Shape Memory and Superelasticity, 3 (4) pp.485–98 (2017).

A.R. Pelton, S.M. Pelton, J. Ulmer, D. Niedermaier, K. Plaskonka, M.R. Mitchell, P. Saffari, "The Use of Next Generation Nitinol For Medical Implants". In: Chakfé N, Heim F, Meichelboeck W, editors. European Symposium on Vascular Biomaterials; October 12-14 2017; Strasbourg, France 2017. p. 35-44.

Alan R. Pelton and Hannah Blaich, "Towards the Understanding of Biocompatibility in Nitinol Medical Devices" SurFACTS in Biomaterials, Spring 2017 Volume 22 Issue 1, pp. 3-7.

Alan R. Pelton, Bjorn Clausen, Aaron Stebner, "In-situ Neutron Diffraction Studies of Increasing Tension Strain Amplitudes of Superelastic Nitinol", ASM International Shape Memory and Superelasticity, Invited Paper, 1 (3) pp 375-386 (2015).

Aaron Stebner, Harshad Paranjape, Bjorn Clausen, L.C. Brinson, and Alan R. Pelton, "In-situ Neutron Diffraction Studies of Large Monotonic Deformations of Superelastic Nitinol", Invited Paper in ASM International Shape Memory and Superelasticity, 1 (2) 252–267 (2015).

Scott W. Robertson, Maximilien Launey, Oren Shelley, Ich Ong, Lot Vien, Karthike Senthilnathan, Payman Saffari, Scott Schlegel, and Alan R. Pelton, "Role of Inclusions on the Fatigue Resistance of Superelastic Nitinol Wire and Tubing", Journal of Mechanical Behavior of Biomedical Materials, 51, 119-131 (2015).

- Shikha Gupta, Alan R. Pelton, Jason Weaver, Xiao-Yan Gong, Srinidhi Nagaraja, "High Compressive Pre-strain Reduces the Bending Fatigue Life of Nitinol Wire", *Journal of Mechanical Behavior of Biomedical Materials*, (44) 15, 96-108 (2015).
- Maximilien Launey, Scott W. Robertson, Oren Shelley, Ich Ong, Alan R. Pelton, "Role of Inclusions on the Tension-Tension Fatigue Resistance of Superelastic Nitinol Wire", *Journal of Mechanical Behavior of Biomedical Materials*, 34, 181–186 (2014).
- A.R. Pelton, J. Fino-Decker, L. Vien, C. Bonsignore, P. Saffari, M. Launey, M.R. Mitchell, "Rotary-Bend Fatigue Characteristics of Medical-Grade Nitinol Wire", *Journal of Mechanical Behavior of Biomedical Materials*, 27, 19-32 (2013).
- Alan R. Pelton, G.H. Huang, P. Moine, and R. Sinclair, "Effects of Thermal Cycling on Microstructure and Properties in Nitinol", *Materials Science & Engineering A*, 532 p130-138 (2012).
- S.W. Robertson, A.R. Pelton and R.O. Ritchie, "Mechanical Fatigue and Fracture of Nitinol", *International Materials Reviews*, 57 (1): (2012) 1-36.
- A. Chinubhai, A. Kueck, P. Saffari, K. Senthilnathan, L. Vien, and A.R. Pelton, "Factors Causing Compressive Damage-Induced Cracking in Nitinol", *Medical Device Materials VI; Proceedings from the Materials & Processes for Medical Devices Conference 2011 (ASM International) January 2013*, p139-142.
- Arkaprabha Sengupta, Panayiotis Papadopoulos, Aaron Kueck and Alan R. Pelton, "On phase transformation models for thermo-mechanically coupled response of Nitinol", *Computational Mechanics*, Volume 48, Issue 2, 213-227, (2011).
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- Alan R. Pelton, "Nitinol Fatigue: A Review of Microstructures and Mechanisms", *Journal of Materials Engineering and Performance* **20** (4): (2011) 613-617.
- Jia Ye, Raj K. Mishra, Alan R. Pelton, Andrew M. Minor, Direct observation of the NiTi martensitic phase transformation in nanoscale volumes, *Acta Materialia* 58 (2010) 490–498.
- Maseo Drexel, Guna Selvadury, and Alan R. Pelton, The Effects of Cold Work and Heat Treatment on the Properties of Nitinol Wire, *Proceedings of the ASM International Conference on Shape Memory and Superelastic Technologies*, Pacific Grove, California, eds: B. Berg, M.R. Mitchell, and J. Proft, p 447-454 (2008).
- Christine Trépanier, Xiao-Yan Gong, Tom Ditter, Alan Pelton, Yasmin Neely and Randy Grishaber, Effect of Wear and Crevice on the Corrosion Resistance of Overlapped Stents, *Proceedings of the ASM International Conference on Shape Memory and Superelastic Technologies*, Pacific Grove, California, eds: B. Berg, M.R. Mitchell, and J. Proft, p 265-276 (2008).
- Amanda Runciman, Katherine C. Chen, Alan R. Pelton, Christine Trépanier, Effects of Hydrogen on the Phases and Transition Temperatures of NiTi, *Proceedings of the ASM International Conference on Shape Memory and Superelastic Technologies*, Pacific Grove, California, eds: B. Berg, M.R. Mitchell, and J. Proft, p 185-196 (2008).

Scott W. Robertson, Robert O. Ritchie, Apurva Mehta, Xiao-Yan Gong and A.R. Pelton, Ultrahigh-Resolution In Situ Diffraction Characterization of the Local Mechanics at a Growing Crack Tip in Nitinol, Proceedings of the ASM International Conference on Shape Memory and Superelastic Technologies, Pacific Grove, California, eds: B. Berg, M.R. Mitchell, and J. Proft, p 35-42 (2008).

Alan R. Pelton and Roy K. Greenberg, "Carotid Stents and Embolic Protection Devices", Endovascular Today, 29-36, May 2008.

A.R. Pelton, V. Schroeder, M.R. Mitchell, Xiao-Yan Gong, M. Barney, and S.W. Robertson, "Fatigue and Durability of Nitinol Stents", J Mech Behavior Biomed Mater, 1, 153–164 (2008).

S. W. Robertson, A. Mehta, A. R. Pelton, and R. O. Ritchie, "Evolution of Crack-Tip Transformation Zones in Superelastic Nitinol Subjected to In Situ Fatigue: A Fracture Mechanics and Synchrotron X-Ray Micro-Diffraction Analysis", Acta Materialia, vol. 55, 2007, pp. 6198-6207.

A. Metha, X.-Y. Gong, V. Imbeni, A. R. Pelton, and R. O. Ritchie, "Understanding the Deformation and Fracture of Nitinol using In Situ Synchrotron X-Ray Micro-Diffraction", Advanced Materials, vol. 19, May 2007, pp. 1183-1186

Alan R. Pelton, Michael D. McCambridge and Shannon L. Pelton, "Active Learning in Materials Science and Engineering", Materials Research Society e-zine (2005).

A.R. Pelton, A. Mehta, L. Zhu, C. Trépanier, V. Imbeni, S. Robertson, M. Barney, and A. Minor, "TiNi Oxidation: Kinetics and Phase Transformations", Solid-to-Solid Transformations in Inorganic Materials 2005, Volume 2: Phase Transformations in Novel Systems or Special Materials, eds: James M. Howe, David E. Laughlin, Jong K. Lee, Ulrich Dahmen, and William A. Soffa, TMS (The Minerals, Metals & Materials Society), 1029-1034 (2005).

Blair London, Jennifer Fino, Alan R. Pelton, and Murray Mahoney, "Friction Stir Processing of Nitinol", Friction Stir Welding and Processing III, eds., K.V. Jata, M.W. Mahoney, R.S. Mishra, and T.J. Lienert, TMS, Warrendale, PA 67-74 (2005).

N. Rebelo, X-Y Gong, A. Hall, A.R. Pelton, and T.W. Duerig, "Finite Element Analysis on the Cyclic Properties of Superelastic Nitinol", Proceedings of ASM-SMST-2004, ed. M. Mertmann, Baden-Baden, Germany, 157-163 (2006).

A. Wick, X.-Y. Gong, J. Fino, J. Sheriff, A.R. Pelton, "Bending Fatigue Characteristics of Nitinol", Proceedings of ASM-SMST-2004, ed. M. Mertmann, Baden-Baden, Germany, 89-94 (2006).

Christine Trépanier and Alan R. Pelton, "Effect of Temperature and pH on the Corrosion Resistance of Nitinol", Proceedings of ASM-SMST-2004, ed. M. Mertmann, Baden-Baden, Germany, 361-366 (2006).

J. Sheriff, A. R. Pelton and L.A. Pruitt, "Hydrogen Effects on Nitinol Fatigue", Proceedings of ASM-SMST-2004, ed. M. Mertmann, Baden-Baden, Germany, 111-115 (2006).

Christine Trépanier and Alan R. Pelton, "Effect of Temperature and pH on the Corrosion Resistance of Nitinol", Proceedings of ASM Materials & Processes for Medical Devices Conference, eds: M. Helmus and D. Medlin, 392-397 (2005).

Pelton, A. R.; Duerig, T. W.; Berg, B.; D.Hodgson; Mertmann, M.; Mitchell, M.; Proft, J.; Wu, M.; Yang, J. "Nitinol Medical Devices", Advanced Materials & Processes, Oct2005, Vol. 163 Issue 10, p63-65 (2005)

J. Sheriff, A. R. Pelton and L.A. Pruitt, "Hydrogen Effects on Nitinol Fatigue", Proceedings of ASM Materials & Processes for Medical Devices Conference, eds: M. Helmus and D. Medlin, 38-43 (2005).

X. Gong, A.R. Pelton, T. Duerig, and A. Hall, "Cyclic Properties of Superelastic Nitinol Tubing", Proceedings of ASM Materials & Processes for Medical Devices Conference, eds: M. Helmus and D. Medlin, 26-31 (2005).

A. Wick, X.-Y. Gong, J. Fino, J. Sheriff, A.R. Pelton, "Bending Fatigue Characteristics of Nitinol", Proceedings of ASM Materials & Processes for Medical Devices Conference, eds: M. Helmus and D. Medlin, 15-20 (2005).

Alan R. Pelton, Tom Duerig and Dieter Stöckel, "A Guide to Shape Memory and Superelasticity in Nitinol Medical Devices, Min Invas Ther & Allied Technol 2004: 13 (4) 218-221.

Lucy Zhu, Christine Trépanier, Jennifer Fino and Alan R. Pelton, "Oxidation of Nitinol and its Effect on Corrosion Resistance", Proceedings of ASM Materials & Processes for Medical Devices Conference, 156-161 (2004).

Alan R. Pelton, Christine Trépanier, Xiao-Yan Gong, Andreas Wick, and Katherine C. Chen, "Structural and Diffusional Effects of Hydrogen in TiNi", Proceedings of ASM Materials & Processes for Medical Devices Conference, 277-282 (2004).

Valentina Imbeni, Alan R. Pelton, Tom Duerig, and R.O. Ritchie, "*In Situ* Multiaxial Loading X-Ray Diffraction Studies in Nickel-Titanium SM Alloy", Proceedings of ASM Materials & Processes for Medical Devices Conference, 209-214 (2004).

Christine Trépanier and Alan R. Pelton, "Effect of Strain on the Corrosion Resistance of Nitinol and Stainless Steel in Simulated Physiological Environment", Proceedings of ASM Materials & Processes for Medical Devices Conference, 176-179 (2004).

Xiao-Yan Gong, Alan R. Pelton, and Tom Duerig, "Fatigue Testing of Diamond-Shaped Specimens", Proceedings of ASM Materials & Processes for Medical Devices Conference 199-204 (2004).

Christine Trépanier and Alan R. Pelton, "Effect of Strain on the Corrosion Resistance of Nitinol and Stainless Steel in Simulated Physiological Environment", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 393-398 (2004).

Christine Trépanier, Lucy Zhu, Jennifer Fino, and Alan R. Pelton, "Corrosion Resistance of Oxidized Nitinol", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 367-373 (2004).

V. Imbeni, A. Mehta, S.W. Robertson, T.W. Duerig, A.R. Pelton, and R.O. Ritchie, "On the Mechanical Behavior of Nitinol Under Multiaxial Loading Conditions and *In Situ* Synchrotron X-Ray", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 267-276 (2004).

Xiao-Yan Gong, Alan R. Pelton, Tom W. Duerig, Nuno Rebelo, and Ken Perry, "Finite Element Analysis and Experimental Evaluation of Superelastic Nitinol Stent", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 453-462 (2004).

Xiao-Yan Gong and Alan R. Pelton, "Finite Element Analysis on Nitinol Medical Devices", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 443-451 (2004).

Alan R. Pelton, Xiao-Yan Gong and Tom Duerig, "Fatigue Testing of Diamond-Shaped Specimens", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 293-302 (2004).

Alan R. Pelton, Christine Trépanier, Xiao-Yan Gong, Andreas Wick and Katherine C. Chen, "Structural and Diffusional Effects of Hydrogen in TiNi", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 33-42 (2004).

Lucy Zhu, Jennifer Fino and Alan R. Pelton, "Oxidation of Nitinol", Proceedings of SMST-2003, Monterey, CA, eds., A.R. Pelton and T.W. Duerig, 357-366 (2004).

Dieter Stöckel, Alan R. Pelton and Tom Duerig, "Self-expanding Nitinol Stents: Material and Design Considerations, European Radiology, **14**, 292-301 (2004).

Alan R. Pelton, Scott M. Russell, and John DiCello, "The Physical Metallurgy of Nitinol for Medical Applications" Journal of Metals, 33-37, May 2003.

X-Y Gong, A.R. Pelton, T.W. Duerig, N. Rebelo and K. Perry, "Finite Element Analysis and Experimental Study on Superelastic Nitinol Stent", presented at 14th US National Congress of Theoretical and Applied Mechanics, Blacksburg, VA, June, 2002.

X-Y Gong and A.R. Pelton, "Finite Element Analysis on Nitinol Medical Applications", Proc. of IMECE 2002: BED **53**, 1-2 (2002).

X-Y Gong,, and A. R., Pelton, "ABAQUS Analysis on Nitinol Medical Applications" ABAQUS Users' Conference Proceedings, Newport, Rhode Island, 1-10, (2002).

T. W. Duerig and A. R. Pelton, "An Overview of Superelastic Stent Design", Materials Science Forum, Vols. 394-395, 1-8 (2002).

X-Y Gong, C. Bonsignore and A. R. Pelton, "A 'Point Cloud' Approach in Superelastic Stent Design", Presented at ASME Annual Congress and Exhibition, NY, NY, November 2001.

A.R. Pelton, J. DiCello, and S. Miyazaki, "Optimization of Processing and Properties of Medical-Grade Nitinol Wire", Proceedings of SMST-2000, Monterey, CA, eds., S.M. Russell and A.R. Pelton, 361-374 (2001).

A. R. Pelton, D. Stöckel, and T. W. Duerig,, "Medical Uses of Nitinol", Materials Science Forum, vol 327-328, 63-70 (2000).

C. Trepanier, R. Venugopalan, A.R. Pelton, "Corrosion resistance of passivated NiTi", 2nd International Symposium on Advanced Biomaterials (ISAB), Montreal, 77, 2000.

A.R. Pelton, J. DiCello, and S. Miyazaki, "Optimisation of Processing and Properties of Medical-Grade Nitinol Wire", Minimally Invasive Therapy & Allied Technologies, vol 9, 107-118 (2000).

C. Trepanier, R. Venugopalan, A.R. Pelton, "Effect of Passivation Treatments on Nickel dissolution from Nitinol", Proceeding of the 6<sup>th</sup> World Biomaterials Congress, Kamuela, HI, 2000.

C. Trépanier, R. Venugopalan, and A. R. Pelton, "Corrosion Resistance and Biocompatibility of Passivated NiTi", in **Shape Memory Implants**, ed L. Yahia, Springer, 35-45 (2000).

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- T. W. Duerig, A. R. Pelton and D. Stöckel, "The Utility of Superelasticity in Medicine", Bio-Medical Materials and Engineering **6** 255-266 (1996).
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