

RISHI RAJ

Department of Mechanical Engineering,
University of Colorado at Boulder, CO, US

Professional Preparation

Allahabad University (India)	Pure Sciences	B.Ss.	1961
University of Durham (England)	Elect. Eng.	B.Sc (Hons I)	1964
Harvard University (Cambridge, MA)	Eng. & App. Science	Ph.D.	1970

Appointments

1996 – present	Professor of Mechanical Engineering, University of Colorado at Boulder, CO
1975 – 1996	Professor of Materials Science and Engineering, Cornell University, Ithaca, NY
1972 – 1975	Assist. Professor of Mechanical Engineering, University of Colorado at Boulder, CO
1971-72	Staff Scientist, Chase Brass and Copper Company, Cleveland, OH
1964-65	Staff Engineer, Standard Telephones and Cables Ltd, London N10, England.
1980	Scientist, Rockwell Science Center, Thousand Oaks, CA

Honors

2004, Aditya Birla Chair Professor of Mechanical Engineering (an Honorary appointment), Indian Institute of Science, Bangalore, India; 1996, John Matthias Scholar, Los Alamos National Laboratory; 1992, Alexander von Humboldt Senior Scientist Awardee, Max Planck Institute for Metal Research in Stuttgart, Germany; 1985, Guggenheim Fellow. 1964, John Mather and Mauder Howe Prizes from the University of Durham, England; 1961, Gold Medals in Chemistry and Mathematics, Allahabad University, India. Fellow of the American Ceramic Society. Highly Cited ISI: h-index=50.

Publications – over 300 including:

Five related to current proposal

1. Ahn, D., & Raj, R. (2010). Thermodynamic measurements pertaining to the hysteretic intercalation of lithium in polymer-derived silicon oxycarbide. *Journal of Power Sources*, 195(12), 3900-3906.
2. Sanchez-Jimenez, P. E., & Raj, R. (2010). Lithium insertion in polymer-derived silicon oxycarbide ceramics. *Journal of the American Ceramic Society*, 93(4), 1127-1135.
3. Ferraioli, L., Ahn, D., Saha, A., Pavesi, L., & Raj, R. (2008). Intensely photoluminescent pseudo-amorphous SiliconOxyCarboNitride polymer-ceramic hybrids. *Journal of the American Ceramic Society*, 91(7), 2422-2424.
4. Saha, A., Raj, R., & Williamson, D. L. (2006). A model for the nanodomains in polymer-derived SiCO. *Journal of the American Ceramic Society*, 89(7), 2188-2195.
5. Saha, A., & Raj, R. (2007). Crystallization maps for SiCO amorphous ceramics. *Journal of the American Ceramic Society*, 90(2), 578-583.

Five other significant publications

1. Pena-Alonso, R., Sicurelli, A., Callone, E., Carturan, G., & Raj, R. (2007). A picoscale catalyst for hydrogen generation from NaBH₄ for fuel cells. *Journal of Power Sources*, 165(1), 315-323.
2. Morcos, R. M., Navrotsky, A., Varga, T., Ahn, D., Saha, A., Poli, F., et al. (2008). Thermodynamically stable SiwCxNyOz polymer-like, amorphous ceramics made from organic precursors. *Journal of the American Ceramic Society*, 91(7), 2391-2393.

3. Morcos, R. M., Navrotsky, A., Varga, T., Blum, Y., Ahn, D., Poli, F., et al. (2008). Energetics of SixOyCz polymer-derived ceramics prepared under varying conditions. *Journal of the American Ceramic Society*, 91(9), 2969-2974.
4. Pena-Alonso, R., Soraru, G. D., & Raj, R. (2006). Preparation of ultrathin-walled carbon-based nanoporous structures by etching pseudo-amorphous silicon oxycarbide ceramics. *Journal of the American Ceramic Society*, 89(8), 2473-2480.
5. Scarmi, A., Soraru, G. D., & Raj, R. (2005). The role of carbon in unexpected visco(an)elastic behavior of amorphous silicon oxycarbide above 1273 K. *Journal of Non-Crystalline Solids*, 351(27-29), 2238-2243.

Synergistic Activities

1. Founding Organizer of Boulder International Workshops on Polymer Derived Ceramics: 1998, 2000, 2002, and 2010 (to be continued in 2012, 2014 and so on).
2. Editor of a Special Issue on Ultrahigh Temperature Polymer Derived Ceramics, *J. American Ceramic Society*, October, 2001.
3. Chair of the Materials Division of ASME, 2001-2002. Executive Committee 1997-2002.
4. Established a Dual Ph.D. program whereby a students receive doctorates in Materials Science from the University of Trento, and in Mechanical Engineering from the University of Colorado at Boulder, and between the University of Colorado and the University of Leoben in Austria.
5. Founding President of “The Polymer Derived Ceramics (PDC) Society”, established August 2010.

Collaborators 2002-2010

Ph.D Students: Susan Krumdieck (presently associate professor at University of Canterbury, NZ), Li-Anne Liew (Post-Doc, NIST, Boulder, CO), Sandeep R. Shah (Air Force Academy, Colorado Springs), Luke Emmert (University of New Mexico), H.-Y. Ryu (at Hyundai in Korea), Tsali Cross (Neah Power Systems, Seattle WA), Dongjoon Ahn (GM Research, Warren, MI), Myongjai Lee (Battery Company, Korea), Lung-hao Hu (Post-Doc). Enzo Castellan (curent), Kalvis Terauds (current), Jason Lonergan (current), C.M. Nagaraj (current), Ibrahim Saleh (current), John Francis (current).

Post Doctoral Research Associates: Linan An (Associate Professor, University of Central Florida), Sandeep R. Shah (Air Force Academy), Atanu Saha (GEGlobal, India), J. S. Kong (Assistant Professor South Korea University, South Korea), S. Brahmamandan (Kennametal), J. Bie (Ceramatec), A. Anal, Aitana Hernandez-Tamayo (University of Madrid Autonoma), Marco Cologna (current), Shantanu Behera (current), Lunghao-Hu (current).

Graduate Student (Extended Stay) Visitors to our Laboratory: Luca Nardone, Univeristy of Trieste, IT, Luca Pederiva, Alberto Scarmi, Luca Santuliana, and Manuela Valentinotti, all from Univeristy of Trento, IT, and A. Rahul, Technical University of Darmstadt, DE. Raquel Pena-Alonso (Trento), Lisa Biasetto (Padova), Marco Cologna (Trento), Fabriza Poli (Stuttgart), Rodrigue Rodrigue Ngoumeni Yappi (Darmstadt), Andre’ Prette (Trento, Italy), Aylin Karakuscu (Los Alamos).

Undergraduates (as Research Assistants): Jesse Morzel (2010), Kyle Florentine (2009-10), Sean Klomparens (2009-10), David Gruber (2009), Shelly Arreguin (2008-2009), Erin Crider (2007), Nolan Viljoen (2007), Reyna Bryan (2006-07), Julia Fletcher(2006), Shivonne Hanif (2006). Jason Crider (2004), Bronwyn Hayworth (2002-4), Laurie Takamori (2003),Mike Vallejo (2003), Vlad Munteneau (2003), Chris Yackacki (2002), Colleen Scott (2002), Carly Greer (2002),

Thesis Advisor and Post-Doc Advisor:

Thesis Advisor: Michael F. Ashby, Post-Doc: N/A