Russell Keanini, PhD

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Education

University of California at Berkeley **PhD, 1992**
Mechanical Engineering

University of Colorado at Denver **MS, 1987**
Mechanical Engineering

Colorado School of Mines **BSc, 1983**
Chemical Engineering

Professional Experience

University of North Carolina at Charlotte **1992-present**

- Assistant Professor, 1992-98; Associate Professor, 1998-2007; Professor, 2007-present.

NASA Graduate Student Researcher, NASA Ames Research Center **1988-89**

- Photophysics Group; Experimental development of laser diagnostic for velocity and density measurements in Mach 10 hypersonic windtunnel flow.

Grad. Research Assist., Mechanical Engineering, University of California, Berkeley **1987-92**

- Application of nonlinear dynamics to acoustic combustion instability in ramjets.
- Finite element and numerical modeling of materials processing and bioengineering problems.
- Theoretical modeling of thermocapillary and buioyancy-driven flow in fluid collars.

Grad. Research Assist., Mechanical Engineering, University of Colorado, Denver **1986-87**

- Experimental studies of stress-induced growth responses of large, single-cell organisms: Phycomyces.

Ensign, US Navy, Inactive Ready Reserve **1984-90**

Relevant Research & Publications (in Collaboration with Dr. Peter Tkacik)

Macroscopic Equilibrium and Nonequilibrium Statistical Mechanical Model Dev'pment **2013-17**

- Keanini, R. G., Tkacik, P. T., Fleischhauer, E., Shahinian, H., Sholar, J., Azimi, F. and Mullany, B. (2017) "Macroscopic liquid-state molecular hydrodynamics," Scientific Reports, 7, 41658.

Validation of Nonequilibrium Stat. Mech. Model (Macroscopic Navier-Stokes Eqns) **2016-19**

- B Mullany, H Shahinian, J Navare, F Azimi, E Fleischhauer, P Tkacik, R Keanini (2017) "The application of computational fluid dynamics to vibratory finishing processes," CIRP Annals, 66, 309-312.
- Keanini, R. G., Tkacik, P. T., Fleischhauer, E., Shahinian, H., Sholar, J., Azimi, F. and Mullany, B. (2017) "Macroscopic liquid-state molecular hydrodynamics," Scientific Reports, 7, 41658 (also listed above).
- E Fleischhauer, J L Dahlberg, J M Solomon, R G Keanini, P T Tkacik (2019) "Kinematic viscosity measurement of granular flows via low Reynolds number cylinder drag experiment," Measurement Sci. and Tech.,30, 055904.

Dev'pment Experimental (PIV) Technique for Grain Particle and Collective Dynamics **2013-19**

- E Fleischhauer, F Azimi, P Tkacik, R Keanini, B Mullany (2016) "Application of particle image velocimetry (PIV) to vibrational finishing," J Materials Processing Tech., 229, 322-328.
- J Dahlberg, P T Tkacik, B Mullany, E Fleischhauer, H Shahinian, F Azimi, J Navare, S Owen, T Bisel, T Martin, J Sholar, R G Keanini (2017) "An Analog Macroscopic Technique for Studying Molecular Hydrodynamic Processes in Dense Gases and Liquids," J. Visulaized Experiments, 130, e56632.

Physical Modeling of Single Atom Dynamics in Nonpolar Liquids **2017-20**

- R G Keanini, J Dahlberg, P T Tkacik (2020) "Single-molecule dynamics in simple liquids: London dispersion and electron screening determine viscosity and high frequency phonons determine self-diffusion," Submitted, Proc. Natl. Acad. Sci.

Research, Teaching and Academic Awards

Research Achievement

- **Kirk Bryan Award (2020)**, with Professor Missy Eppes, bestowed by the Geological Society of America, to "...the author or authors of a published paper of distinction advancing the science of geomorphology or some related field, such as [Pleistocene] Quaternary geology." For: M Eppes and R G Keanini (2017) "Mechanical weathering and rock erosion by climate-dependent subcritical cracking," Reviews of Geophysics, 55, pp. 470-508.
- **Finalist, Melosh Medal Competition in Finite Element Analysis (1993)**, Duke University. For: R G Keanini and B. Rubinsky (1993), "Three-dimensional simulation of the plasma arc welding process" Int. J Heat Mass Transfer, 36, pp. 3283-3298.

Teaching

- **Nominee William States Lee College of Engineering Excellence in Teaching Award (2006, 2010, 2012)**, UNC Charlotte, for excellence in undergraduate or graduate teaching.

Research Development

- **Research Initiation Grant, Engineering Foundation & American Soc.Mechanical Engineers (1993-94)**
- **Oak Ridge Associated Universities Junior Faculty Enhancement Award (Engineering) (1995-96).** This and previous awarded for development of development of numerical and experimental tools for studying materials joining processes.
- **NASA Graduate Student Researcher Fellowship (1988-89)**, NASA Ames Research Center, Experimental development of laser diagnostic for hypersonic velocity and density measurements in Mach 10 Hypersonic Windtunnel Facility.

Funded DoD and Project-Related Research (Last Eight Years)

- **Engaging Military Veterans to Increase Engineering Enrollment and BS, MS, and PhD Degrees Awarded**, $750,000, DOD Office of Naval Research, PT Tkacik, PI, RG Keanini et al., co-PI's (9/04/2018-9/30/21).
- **Engaging Military Veterans to Increase STEM Enrollment and Degrees Awarded**, $600,000, DOD Department of the Navy, PT Tkacik, PI, RG Keanini et al., co-PI's (10/1/2014-12/31/17).

Thumbnail Sketch of Research Productivity & Grad Student Supervision

- **48 refereed journal publications; 34 refereed conference papers**
- **Google Scholar: citations: 837, h-index = 16, i10-index=22**
- **ResearchGate RG Score: 30.04**
- **US Patent: "Apparatus and Method for Creating Dry Underwater Welds," 1999, U.S. Patent No. 5,981,896. RG Keanini, M Newman, G Lowery and G Fredericks**
- **Dissertation Supervisor to 4 PhD students**
- **Thesis Supervisor to 29 Masters students**
- **Three former graduate students are tenure track faculty at Georgia Tech, Colorado State Univ., Gaston (NC) Community College**