

ERIC ISAAC CORWIN

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PREVIOUS APPOINTMENTS

Asst Professor University of Oregon
2010–2016 Materials Science Institute and Department of Physics, Eugene, Oregon

EDUCATION

Postdoc Area of specialization: Particle packing and protein biophysics
2007–2010 Postdoc advisor: Jasna Brujic
New York University Center for Soft Matter Research, New York, NY

Physics PhD Area of specialization: Granular materials
2001–2007 Thesis: *Granular flow in a rapidly rotated system with fixed walls*
Advisors: Heinrich Jaeger and Sidney Nagel
University of Chicago, Chicago, IL

Bachelor of Arts Physics, *magna cum laude*
1997–2001 Senior project advisor: David Weitz
Harvard University, Cambridge, MA

GRANTS, RECEIVED

2021 Fund For Faculty Excellence, \$20,000.

2020 Keck Foundation grant for “Extreme Diffusion”, \$1,000,000 (\$800,000 to UO).

2016 Simons Collaboration on Cracking the Glass Transition, \$16,000,000 (\$1,145,269 to UO).

2015 NSF MRI DMR-1532225: Acquisition of an Atomic Force Microscope with Optical, Thermal, and Electrical Analysis Capabilities. Co-PI, lead PI B. J. Aleman, \$283,906 to UO.

2012 NSF CAREER Award DMR-1255370: The Jamming Phase Transition in 2D, 3D, and Beyond, \$560,000 to UO.

2011 Williams Award for development of Atomic Force Microscopy teaching module, \$30,600 to UO.

REFEREED PUBLICATIONS (* DENOTES ALPHABETICAL AUTHOR LIST)

V.F. Hagh, S.R. Nagel, A.J. Liu, M.L. Manning, E.I. Corwin, “Transient degrees of freedom for introducing function in materials”, *PNAS*, **119** (19) e2117622119, (2022).

- R.C. Dennis, E.I. Corwin, "Dionysian hard sphere packings are mechanically stable at vanishingly low densities", *PRL*, **128**, 018002, (2022).
- F. Arceri, E.I. Corwin, V.F. Hagh, "Marginal stability enables memory training in jamming solids", *PRE*, **104**, 044907 (2021).
- P. Rissone, E.I. Corwin, G. Parisi, "Long-range anomalous decay of the correlation in jammed packings", *PRL*, **127**, 038001 (2021).
- *P. Charbonneau, E.I. Corwin, R.C. Dennis, R. Díaz Hernández Rojas, H. Ikeda, G. Parisi, F. Ricci-Tersenghi, "Finite size effects in the microscopic critical properties of jammed configurations: a comprehensive study of the effects of different types of disorder", *PRE*, **104**, 014102 (2021).
- P.K. Morse, S. Roy, E. Agoritsas, E. Stanifer, E.I. Corwin, M.L. Manning, "A direct link between active matter and sheared granular systems", *PNAS*, **118** (18), e2019909118 (2021).
- *G. Biroli, P. Charbonneau, E.I. Corwin, Y. Hu, H. Ikeda, G. Szamel, F. Zamponi, "Interplay between percolation and glassiness in the random Lorentz gas", *PRE*, **103**, L030104 (2021).
- J.D. Sartor, S.A. Ridout, E.I. Corwin, "Mean-Field Predictions of Scaling Prefactors Match Low-Dimensional Jammed Packings", *PRL*, **126**, 048001 (2021).
- F. Arceri, E.I. Corwin, "Vibrational properties of hard and soft spheres are unified at jamming", *PRL*, **124**, 238002 (2020).
- J.D. Sartor, E.I. Corwin, "Direct measurement of force configurational entropy in jamming", *PRE*, **101**, 050902(R) (2020).
- A.P. Hammond, E.I. Corwin, "Experimental observation of the marginal glass phase", *PNAS*, **117** (11) 5714-5718 (2020).
- R.C. Dennis, E.I. Corwin, "The Jamming Energy Landscape is Hierarchical and Ultrametric", *PRL*, **124**, 078002 (2020).
- *L. Berthier, G. Biroli, P. Charbonneau, E.I. Corwin, S. Franz, F. Zamponi, "Perspective: Gardner Physics in Amorphous Solids and Beyond", *J Chem Phys*, **151**, 010901 (2019).
- *P. Charbonneau, E.I. Corwin, L. Fu, G. Tsekenis, M van der Naald, "Gardner Phase in Minimally Polydisperse Crystalline Systems", *PRE*, **99**, 020901(R) (2019).
- V.F. Hagh, E.I. Corwin, K. Stephenson, M.F. Thorpe, "A broader view on jamming: from spring networks to circle packings", *Soft Matter*, **15**, 3076 (2018).
- A.J. Trevelyan, G. Tsekenis, E.I. Corwin, "Degree product rule tempers explosive percolation in the absence of global information", *PRE*, **97**, 020301(R) (2018).
- A.P. Hammond, E.I. Corwin, "Direct measurement of the ballistic motion of a freely floating colloid in Newtonian and viscoelastic fluids", *PRE*, **96**, 042606 (2017).
- P.K. Morse, E.I. Corwin, "Echoes of the glass transition in athermal soft spheres", *PRL*, **119**, 118003 (2017).
- M.Y. Karim, E.I. Corwin, "Universality in quasi-two-dimensional granular shock fronts above an intruder", *PRE*, **95**, 060901(R), (2017).

- K.J. Welch, A. Liebman-Pel̄i; $\frac{1}{2}$ ez, E.I. Corwin, Fluids by design using chaotic surface waves to create a metafluid that is Newtonian, thermal, and entirely tunable, *PNAS*, **113**(39), (2016).
- P.K. Morse, E.I. Corwin, Hidden symmetries in jammed systems, *Journal of Statistical Mechanics: Theory and Experiment*, Special Issue on Structure in Glassy and Jammed Systems, 074009, (2016).
- *P. Charbonneau, E.I. Corwin, G. Parisi, A. Poncet, F. Zamponi, Universal Non-Debye Scaling in the Density of States of Amorphous Solids, *Phys Rev Lett*, **117**, 045503, (2016).
- P.K. Morse, E.I. Corwin, Geometric order parameters derived from the Voronoi tessellation show signatures of the jamming transition, *Soft Matter*, **12**(4), 1248-1255 (2016).
- *P. Charbonneau, E.I. Corwin, G. Parisi, F. Zamponi, Jamming Criticality Revealed by Removing Localized Buckling Excitations, *Phys Rev Lett*, **114**, 125504 (2015).
- K.J. Welch, C.S.G. Kilmer, E.I. Corwin, Atomistic study of macroscopic analogs to short chain molecules, *Phys Rev E*, **91**, 022603 (2015).
- C. Zhang, C.B. O'Donovan, E.I. Corwin, F. Cardinaux, T.G. Mason, M.E. Möbius, F. Scheffold, Structure of marginally jammed polydisperse packings of frictionless spheres, *Phys Rev E*, **91**, 032302 (2015).
- P.K. Morse, E.I. Corwin, Geometric Signatures of Jamming in the Mechanical Vacuum, *Phys Rev Lett*, **112**, 115701 (2014).
- M.Y. Karim, E.I. Corwin, Eliminating friction with friction: 2D Janssen effect in a friction-driven system, *Phys Rev Lett*, **112**, 188001 (2014).
- K.J. Welch, I. Hastings-Hauss, R. Parthasarathy, E.I. Corwin, Ballistic and diffusive dynamics in a two-dimensional ideal gas of macroscopic chaotic Faraday waves, *Phys Rev E*, **89**, 042143 (2014).
- E.I. Corwin, R. Stinchcombe, M.M. Thorpe, Bond percolation in higher dimensions, *Phys Rev E*, **88**, 014102 (2013).
- C.B. O'Donovan, E.I. Corwin, M.E. Möbius, Mean-field granocentric approach in 2D & 3D polydisperse, frictionless packings, *Phil Mag*, **93**:31-33, 4030-4056 (2013).
- *P. Charbonneau, E.I. Corwin, G. Parisi, F. Zamponi, Universal Microstructure and Mechanical Stability of Jammed Packings, *Phys Rev Lett*, **109**, 205501 (2012).
- *M. Clusel, E.I. Corwin, Unfolding protein with an atomic force microscope: Force-fluctuation induced non-exponential kinetics, *Phys Rev E*, **84**, 041920, 2011.
- J.R. Royer, B. Conyers, E.I. Corwin, P.J. Eng, H.M. Jaeger, The role of interstitial gas in determining the impact response of granular beds, *Euro Phys Lett*, **93**, 28008, 2011.
- E.I. Corwin, M. Clusel, A.O.N. Siemens, and J. Brujic, Model for random packing of polydisperse frictionless spheres, *Soft Matter*, **6**, 2949-2959, 2010.
- E.I. Corwin, M. Clusel, A.O.N. Siemens, J. Brujic, A "granocentric" model for random packing of jammed emulsions, *Nature* **460**, 611-615, 2009.
- J.R. Royer, E.I. Corwin, B. Conyers, A. Flior, M.L. Cordero, M.L. Rivers, P.J. Eng, H.M. Jaeger, Birth and growth of a granular jet, *Phys Rev E*, **78**, 011305, 2008.

E.I. Corwin, E.T. Hoke, H.M. Jaeger, S.R. Nagel, Temporal force fluctuations measured by tracking individual particles in granular materials under shear, *Phys Rev E*, **77**, 061308, 2008.

E.I. Corwin, Granular flow in a rapidly rotated system with fixed walls, *Phys Rev E*, **77**, 031308, 2008.

J.R. Royer, E.I. Corwin, P.J. Eng, H.M. Jaeger, Gas-mediated impact dynamics in fine grained granular materials, *Phys Rev Lett*, **99**, 038003, 2007.

E.I. Corwin, H.M. Jaeger, S.R. Nagel, Structural signature of jamming in granular media, *Nature* **435**, 1075-1078, 2005.

J.R. Royer, E.I. Corwin, A. Flior, M.L. Cordero, M.L. Rivers, P.J. Eng, H.M. Jaeger, Formation of granular jets observed by high-speed X-ray radiography, *Nature Physics* **1**, 164-167, 2005.

T.P. Bigioni, X.M. Lin, T.T. Nguyen, E.I. Corwin, T.A. Witten, H.M. Jaeger, Kinetically driven self-assembly of highly ordered nanoparticle monolayers, *Nature Materials* **5**, 265-270, 2006.

E.R. Dufresne, E.I. Corwin, N.A. Greenblatt, J. Ashmore, D.Y. Wang, A.D. Dinsmore, J.X. Cheng, X.S. Xie, J.W. Hutchinson, D.A. Weitz, Flow and fracture in drying nanoparticle suspensions, *Phys Rev Lett* **91**, 224501, 2003.

UNPUBLISHED REFEREED PUBLICATIONS (* DENOTES ALPHABETICAL AUTHOR LIST)

J.B. Hass, A.N. Carroll-Godfrey, I. Corwin, E.I. Corwin, "Anomalous fluctuations of extremes in many-particle diffusion", *PRL*, under submission (2022).

J.R. Dale, J.D. Sartor, R.C. Dennis, E.I. Corwin, "Hyperuniform jammed sphere packings have anomalous material properties", *PRL*, under review (2022).

R.C. Dennis, V.F. Hagh, E.I. Corwin, "Emergence of zero modes in disordered solids under periodic tiling", *PRL* under review (2022).

J.D. Sartor, E.I. Corwin, "Predicting defects in soft sphere packings near jamming using the force network ensemble", *PRL*, under review, (2021).