

August E. (Gus) Evrard

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Education and Training

BS: Physics (summa cum laude), University of Pennsylvania, 1981

PhD: Physics, State University of New York, Stony Brook, 1986

Postdoctoral: Institute of Astronomy, Cambridge, UK, 1986-88; UC, Berkeley Astronomy, 1988-90

Experience in Cosmology and Data Science

- First Generation Computational Cosmologist
- Design Team Leader, *Academic Reporting Tools 2.0*, U-M Digital Innovation Greenhouse, 2015–
- Design Team Leader, *Problem Roulette*, U-M cloud-based study service, 2011–
- Co-Leader, Simulation Work Group, Dark Energy Survey Collaboration, 2007–2015
- Director of Academic Community Engagement, U-M Advanced Research Computing, UMOR, 2012–2015
- Chair, Information Technology Committee, U-M College of Literature, Sciences and Arts, 2000–02, 05–08

Accomplishments and Awards

- American Physical Society Fellow, *For groundbreaking work in simulations of large-scale structure with particular emphasis on the theory of galaxy clusters*, 2012
- University of Michigan Arthur F. Thurnau Professor, 2009–
- Developed first multi-fluid, 3-D simulation code for cosmological structure formation (P3MSPH), 1988
- 150+ publications, 18000+ citations, h-index = 55 (Google Scholar)
- Scientific Organizing Committee member for 28 international conferences and workshops, 1993–2016
- Designed Academic Reporting Tools, College of Literature, Science and the Arts (in service since 2006)
- Initiated Great Lakes Cosmology Workshop Series (ten instances since 1991)
- Associate Director for Budget, Michigan Center for Theoretical Physics, 2008–10
- Associate Chair for Undergraduate Education, U-M Physics, 2010–12
- University of Michigan Provost's Teaching Innovation Prize, 2011 (Finalist, 2012 and 2013)
- Steering Committee, NSF OCI Science Gateway Institute, UCSD, 2012–14

Recent Synergistic Activities

- ORCID Ambassador for University of Michigan, 2013–
- Created new course, *Cyberscience: Computational Science and the Rise of the Fourth Paradigm*, 2011
- Advisory Board, Digital Innovation Greenhouse, 2015–
- Steering Committee, Michigan Institute for Computational Discovery and Engineering (MICDE), 2013–
- Co-I, \$2.4M NSF MRI, *CONFLUX: Development of a Novel Platform for Data-driven Computational Physics*, 2015–18
- Collaborator, \$2M NSF Education, *The M-STEM Academies at the University of Michigan: An Integrated Approach to Increase the Number and Diversity of Undergraduates in STEM Disciplines*, 2012-17
- U-M Representative, Data Management Implementations Workshop, NSF-CASC, 2013
- Chair, Provost's Search Committee for the University of Michigan Librarian/Dean of Libraries, 2012-13

Representative Papers

Problem Roulette: Studying Introductory Physics in the Cloud, A.E. Evrard, M. Mills, D. Winn, K. Jones, J. Tritz, T.A. McKay, 2015, *Am J Phys*, 83, 76 (arXiv:1309.7678).

Describes a service to provide random-within-topic access to old exam problems in large introductory courses. 2M+ problem instances served to 10,000+ U-M students across eight courses since 2013.

Persistent, Global Identity for Scientists via ORCID, 2015, A.E. Evrard, C. Erdmann, J. Holmquist, J. Damon, D. Dietrich, arXiv:1502.06274.

An advocacy paper describing the benefits of ORCID to astronomers and physicists.

A Model for Multi-property Galaxy Cluster Statistics, A.E. Evrard, P. Arnault, D. Huterer, A. Farahi, 2014, *Mon. Not. Royal Astron. Soc.*, 441, 3562.

Presents analytic (fast computable) forms for multi-property probabilities in galaxy cluster surveys.

A High-throughput Workflow Environment for Cosmological Simulations, B.M.S Erickson, R. Singh, A.E. Evrard, M.R. Becker, M.T. Busha, A.V. Kravtsov, S. Marru, M. Pierce, R.H. Wechsler, 2012, *ACM Proceedings of XSEDE12*, 34:1-34:8. doi:10.1145/2335755.2335830.

Describes a collaborative effort with Indiana University computer scientists to build a high-level workflow tool for production and processing of cosmological simulations.

Cosmological Parameters from Observations of Galaxy Clusters, S.W. Allen, A.E. Evrard, A.B. Mantz, 2011, *Annual Rev. Astron. Astrophys.*, 49, 409.

A general review of cluster cosmology (300 NASA ADS citations).

Simulations of the Formation, Evolution and Clustering of Galaxies and Quasars, V. Springel, S.D.M. White, A. Jenkins, C.S. Frenk, N. Yoshida, L. Gao, J. Navarro, R. Thacker, D. Croton, J. Helly, J.A. Peacock, S. Cole, P. Thomas, H. Couchman, A. Evrard, J. Colberg, F. Pearce, 2005, *Nature*, 435, 629.

First ten billion-particle N-body simulation of cosmic structure with derived 'semi-analytic' galaxy catalogs (2400 NASA ADS citations).

Collaborations

[Dark Energy Survey](#): Builder, former Simulation Working Group co-Leader

An international collaboration using the Blanco Telescope in Chile to survey 5000 sq. deg of sky in five optical filters, DES is the first project to enable application of four principal methods of dark energy and cosmic acceleration (clusters of galaxies, gravitational lensing, galaxy clustering, and Type Ia supernovae) to the same data.

[XMM-XXL Survey](#): Simulation Team Coordinator

The roughly 100 members of XXL are identifying and characterizing galaxy clusters and other X-ray sources of X-ray across 50 sq deg using a 3 Msec time allocation on the XMM-Newton satellite observatory. Dark energy and baryon evolution in massive structures are principal science drivers.

Mentorship

- Faculty: D. Huterer (Michigan), C. Miller (Michigan), E. Gull (Michigan), K. Romer (Pitt)
- Postdoctoral: H. Wu (UCLA), C. Cunha (Bosch), J. Mohr (Munich), R. Wechsler (Stanford), E. Rasia (Trieste), D. Winn (Michigan)
- Graduate Students: F. Summers (AMNH), M. Crone (Skidmore), C. Metzler (USNL), P. Brieu (UCLA), B. Mathiesen (Thomson Reuters), J. Bialek (deceased), M. Busha (Stanford), R. Stanek (UC, Berkeley), B. Nord (Fermilab), A. Chen (A9 Systems), B. Erickson (Northrup Grumman), A. Farahi (current)
- Member of 61 U-M doctoral thesis committees since 1991.