Dr. Matthew R. Francis

Cleveland, Ohio
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- Current position: Freelance physics and astronomy writer
- Programming/scripting languages: Python, C/C++, Matlab, Fortran 90/95, Perl, R, Bash
- Office software: LaTeX, word processing, spreadsheets, presentations
- Misc. development: HTML/XHTML, CSS, Wordpress, GIMP, Audacity

Education

- Rutgers University, Piscataway, New Jersey: Ph.D. in Physics and Astronomy, May 2005
- Johns Hopkins University, Baltimore, Maryland: 1998–1999
- Central College, Pella, Iowa: B.A. in Physics, May 1998

Selected Recent Work

- Contributing writer (complete portfolio at bowlerhatscience.org/writing-portfolio/)
    - *Mosaic Science* (Oct. 2015), What is Life?
    - *The Daily Beast* (2014–present) (www.thedailybeast.com/contributors/matthew-francis.html)
    - *Forbes* (www.forbes.com/sites/matthewfrancis/)
    - *Ars Technica* (2012–present, arstechnica.com/author/matthew-francis/)
    - *NOVA* (2014–present, www.pbs.org/wgbh/nova/blogs/physics/author/matthew-francis/)
    - *Symmetry Magazine* (http://www.symmetrymagazine.org/author/matthew-r-francis)
    - *Smithsonian Air & Space* (July 2015), The Universe is Ringing
    - *Scientific American* (Jan. 2015), Weird X-rays spur speculation about dark matter
    - *Slate* (www.slate.com/authors.matthew_r_francis.html)
    - *Aeon* (bowlerhatscience.org/writing-portfolio/writing-portfolio-aeon-magazine/)
    - *Physics World* (bowlerhatscience.org/writing-portfolio/writing-portfolio-physics-world/)
- Director, CosmoAcademy (2013–present, cosmoquest.org/x/cosmoacademy/about-cosmoacademy/)
- Galileo's Pendulum, personal science blog (2010–present, GalileosPendulum.org/)

Selected Public Presentations and Outreach

- "Gravity: a Love Story" (Nov. 21, 2014): astronomy colloquium at New Mexico State University (available on YouTube)
- "DIY Science Zone" workshop, GeekGirlCon geekgirlcon.com (2013 and 2014)
- "Lessons in the communication of science from the BICEP2 story" (Oct. 20, 2014): panel moderator at the National Association of Science Writers/Council for the Advancement of Science Writing (NASW/CASW) meeting
- "Gravity: a Love Story" (Nov. 14, 2013): presentation to University of Central Arkansas Society of Physics Students (www.youtube.com/watch?v=waqHDqv8LME)
- "Ugly Telescope, Beautiful Science" (July 9, 2013) at Richmond Astronomical Society (Science Museum of Virginia in Richmond, Virginia)

- "Mining for Dark Matter" (June 4, 2013) and "Black Holes Don't Suck" (Sept. 4, 2012) at Science Pub RVA in Richmond, VA
- "Science Saturday" presentation at Richmond (Virginia) Public Library (Nov. 10, 2012)
- "Science Drop-in"and "Lightning" talks at the North Carolina Museum of Natural Sciences (Aug. 16 and 17, 2012)
- Moderator/presenter: Science Online 2012, Science Online 2013, and Science Online 2014, North Carolina State University
- Director, M.D. Anderson Planetarium (2007-2009)
    - Presented twice-monthly public programs and frequent shows for school groups
    - Original Programming:
        - "See How Far the Light Came"; written/produced for the Grand Reopening
        - "Could There Be Life in the Solar System?", show for K-3 schoolchildren (collaboration with the Lambuth Education Department)
        - "Saturn: News from the Ringed Planet", special presentation on Apr. 7, 2008
        - "Water on Mars, Life on Mars", special presentation for Fall 2008
    - TV interview, "Good Morning West Tennessee", WBBJ/ABC affiliate (Feb. 7, 2008)
- See bowlerhatscience.org/public-speaking/ for a complete list

Previous Positions

- Visiting Assistant Professor of Physics, Randolph-Macon College (2009-2011)
- Assistant Professor of Physics, Lambuth University (2007-2009)
- Special Lecturer, New Jersey Institute of Technology (NJIT) (2006–2007)
- Independent contractor (Python programming), Right Force Orthodontics (2006)
- Adjunct Faculty Member, Rutgers University (2005–2006)
- Postdoctoral Researcher, Atacama Cosmology Telescope Project (2005)

Social Networking

- Twitter: @DrMRFrancis
- Facebook: facebook.com/GalileosPendulum
- Google+: plus.google.com/+MatthewFrancis/

Refereed Papers

- **M. R. Francis** and E. J. Fertig (2012) Quantifying the Dynamics of Coupled Networks of Switches and Oscillators. PLoS ONE 7(1): e29497. DOI: 10.1371/journal.pone.0029497
- **M. R. Francis**, R. Bean, and A. Kosowsky, Impact of Systematic Errors on Sunyaev-Zel'dovich Effect Surveys, *JCAP* **0512** (2005), 001. astro-ph/0511161
- **M. R. Francis** and A. Kosowsky, The Construction of Spinors in Geometric Algebra, *Ann. Phys.* **317** (2005), 383–409. math-ph/0403040
- **M. R. Francis** and A. Kosowsky, Geometric Algebra Techniques for General Relativity, *Ann. Phys.* **311** (2004), 459–502. gr-qc/0311007
- **M. R. Francis** and A. Kosowsky, Geodesics in the Generalized Schwarzschild Solution, *Am. J. Phys.* **72** (2004), 1204–1209. gr-qc/0311038
- J. Javanainen, J. Ruostekoski, B. Vestergaard, and **M. R. Francis**, One-Dimensional Modeling of Light Propagation in Dense and Degenerate Samples, *Phys. Rev. A* **59** (1999), 649–666. DOI: 10.1103/PhysRevA.59.649