

Matthew Clay Fleenor

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POSITION: Professor of Physics & Astronomy
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University of North Carolina, Chapel Hill

AUG 2001 - AUG 2006
Doctorate (PhD) Physics & Astronomy

University of Massachusetts, Boston

SEP 1999 - AUG 2001
Master of Science (MS) Applied Physics

University of Tennessee, Knoxville

SEP 1995 - MAY 1998
Master of Science (MS) Secondary Science Education

AUG 1989 - MAY 1994
Bachelor of Science (BS) Materials Science & Engineering

ACADEMIC EXPERIENCE

UNDERGRADUATE

Professor (2019–), *Roanoke College (VA)*
Physics Group & Dual-degree Coordinators (2014–2020), *Roanoke College (VA)*
Associate Professor (2012–2018), *Roanoke College (VA)*
Assistant Professor (2006–2012), *Roanoke College (VA)*
Astronomy Lab Coordinator (2004), *University of North Carolina, Chapel Hill (UNC)*
Planetarium Instructor (2002–2004), *UNC*
Physics & Astronomy Teaching Assistant (2001–2002), *UNC*
Physics Teaching Assistant (1999–2001), *University of Massachusetts, Boston*

SECONDARY

Calculus, Geometry Instructor (1999), *New England Hebrew Academy (MA)*
Physics, Chemistry I & II Instructor (1996–1999), *Christian Academy of Knoxville (TN)*

AWARDS & HONORS

2019–, STEM Faculty Fellow, Lilly Fellows Program
2019, Advisor, Outstanding Chapter Award, Society of Physics Students
2015–2018, Faculty Scholar, Roanoke College
2018, Advisor, Blake Lilly Prize for Outreach, Society of Physics Students
2016–2018, Advisor, Distinguished Chapter Award, Society of Physics Students
2017, Eclipse Ambassador, Great Smoky Mountains National Park
2015–2017, 2012, Excellence in Teaching Award, Roanoke College, Nominee
2016, Finisher– “2,000 miler”, Appalachian Trail
2013–2015, DOE Visiting Faculty Researcher, Oak Ridge National Laboratory
2011, Fulbright Scholar Award, Candidate in Astrophysics
2008, National Gallery Day, Writing Contest Winner– Faculty Division, Roanoke College
2006, Dissertation Presentation Award, American Astronomical Society

VOCATIONAL ASPIRATION

I aspire to further both a professional and public understanding of the sciences as an on-going human enterprise. Under this umbrella are included my professional

research areas of observational astrophysics and nuclear materials detection. Activities promoting scientific literacy in basic astronomy and physics (K–16) as well as the historical and biographical impact on current science education are also essential to my vocation.

From this statement, three creative streams emerge from which I express my vocation: professional research in imaging, science education promotion, and scientific literacy for the public.

PROFESSIONAL FRUITFULNESS

ASTRONOMICAL AND RADIATION IMAGING

– Completed Manuscript:

Fleenor, M. C. (2006), *Morphology and Large-Scale Structure within the Horologium-Reticulum Supercluster of Galaxies*, Dissertation under the direction of James A. Rose, Chapel Hill, NC.

– Accepted Refereed Publications:

Fleenor, M. C., Blackston, M. A., & Ziock, K.–P. (2015), “Statistical Correlated Uncertainties in Coded-Aperture Imaging”, *Nuclear Instruments and Methods in Physics Research Section A*, **784**, 370–376.

Fleenor, M. C. & Johnston–Hollitt, M. (2010), “Megaparsec–Scale Triggers for Star Formation: Clusters and Filaments of Galaxies in the Horologium-Reticulum Supercluster”, in Smith, B. et al., ed., *Proceedings of Galaxy Wars: Stellar Populations and Star Formation in Interacting Galaxies*. Astro. Soc. Pacific, San Francisco, 81–86.

Johnston–Hollitt, M., Sato, M., Gill, J. A., Fleenor, M. C., & Brick, A.–M. (2008), “Radio Observations of the Horologium-Reticulum Supercluster– I. A3158: Excess star-forming galaxies in a merging cluster?”, *Monthly Notices of the Royal Astronomical Society*, **390**, 289–303.

Miller, J., Quammen, C., & Fleenor, M. C. (2006), “Interactive Visualization of Intercluster Galaxy Structures in the Horologium-Reticulum Supercluster”, *IEEE Transactions on Visualization and Computer Graphics Journal*, **12**, 1149–1155.

Fleenor, M. C., Rose, J. A., Christiansen, W. A., Johnston-Hollitt, M., Hunstead, R. W., Drinkwater, M. J., & Saunders, W. (2006), “Redshifts and Velocity Dispersions of Galaxy Clusters in the Horologium-Reticulum Supercluster”, *Astronomical Journal (AJ)*, **131**, 1280–1287.

Fleenor, M. C., Rose, J. A., Christiansen, W. A., Hunstead, R. W., Johnston-Hollitt, M., Drinkwater, M. J., & Saunders, W. (2005) “Large-Scale Velocity Structures in the Horologium-Reticulum Supercluster”, *AJ*, **130**, 545–563.

Johnston-Hollitt, M., Fleenor, M.C., Rose, J.A., Christiansen, W.A., & Hunstead, R.W. (2004), “Radio Imaging of Head-tailed Galaxies from an Infalling Filament of the Horologium-Reticulum Supercluster,” *Proceedings of the IAU Colloquium 195* held at the University of Torino, Torino, IT, 12-16 March 2004, Edited by A. Diaferio.

– Presentations:

“Bootstrapped Uncertainties in Coded-Aperture Images” (2016), Contributed Poster (~ 50% acceptance), IEEE Nuclear Science Symposium/Medical Imaging Conference (NSS/MIC), 31 OCT, Strasbourg, France

“Statistical Correlated Uncertainties in Coded-Aperture Imaging” (2014), Contributed Oral (~ 60% acceptance), Symposium of Radiation Measurements and Analysis (SORMA) XV, Univ. of Michigan, 11 JUN, Ann Arbor, MI

“How Multi-Wavelength Datasets Aid in Galaxy Evolution Studies” (2012), Invited Oral, University of Virginia, Astronomy Colloquium, 10 APR, Charlottesville, VA

“Advantages at Multi-Wavelengths: A Pre-Processed Galaxy Group within a Cluster” (2011), Contributed Oral (~ 70% acceptance), *Structure in Clusters and Groups of Galaxies in the Chandra Era*, 14 JUL, Boston, MA

“Megaparsec-Scale Triggers for Star Formation: Clusters and Filaments of Galaxies in the Horologium-Reticulum Supercluster” (2009), Contributed Oral (~ 30% acceptance), *Galaxy Wars: Stellar Populations and Star Formation in Interacting Galaxies*, 21 JUL, Johnson City, TN

“Radio Properties of the Merging Cluster Complex A3128/A3125” (2007), Contributed Poster with Johnston-Hollitt, M., Rose, J. A., Christiansen, W. A., Hunstead, R. W., *Frontiers of Astrophysics: A Celebration of NRAO’s 50th Anniversary*, 18-21 JUN, Charlottesville, VA

“Characteristics of Megaparsec-scale Structures in the Horologium-Reticulum Supercluster of Galaxies” (2007), Contributed Oral (~ 50% acceptance), *American Astronomical Society National Meeting*, 5–10 JAN, Seattle, WA

– Accepted External, Refereed Proposals:

2015, “Assessing Coded-aperture Imager Capabilities through Bootstrap Sampling”, Department of Energy Visiting Faculty Program (DOE VFP)– Oak Ridge National Laboratory (TN), \$15K.

2014, “Development of Detection Algorithms for Coded-Aperture Imaging”, DOE VFP– Oak Ridge National Laboratory (TN), \$25K.

2013, “Toward a Statistical Analysis of Coded-Aperture Imager Data”, DOE VFP– Oak Ridge National Laboratory (TN), \$15K.

2011, “Operating on Multiwavelengths: Observational and Pedagogical Astrophysics”, Fulbright Scholar Program– New Zealand, accepted at the disciplinary review stage.

SCIENCE EDUCATION PROMOTION

– Accepted Peer-reviewed Publications:

Fleenor, M.C. (2019) “Role-playing Simulation as an Avenue for History of Science Awareness”, *Sixteenth Century Journal*, **50** no. 4, 1149–1154.

Fleenor, M.C. (2018) “Cultivating Experimental Innovation Within Undergraduate Physics Majors”, *Global Education Review*, **5** no. 1, 73–87.

Poli, D., Fleenor, M.C., & Rearick, M. (2012), “Drawing on Popular Culture: Using Tattooing to Introduce Biological Concepts”, *American Biology Teacher*, **74** no. 6, 381-385.

Fleenor, M.C., Poli, D., & Rearick, M. (2010), “Having your cake and eating too: student engagement and collaborative faculty development”, *Proceedings of the Lilly Conference on College and University Teaching* held at Univ. of North Carolina Greensboro, 5–7 Feb. 2010, Ed. R. Purdom.

Fleenor, M.C. (2009), “Modeling Stupidity”, *The Teaching Professor*, **23**, 2.

– Conferences & Workshops in Science Education:

“Earth Patterns, Cycles, and Change” (2011–12), Invited Instructor for Earth & Space Science Standards of Learning, Grades 3–5 (regional), Hollins Elementary Science Institute for Teachers, 16–28 JUN, Hollins University (VA).

“Integrative Learning through Collaborative Teaching Grants” (2010), Invited Oral with S. Kirby and D. Sarabia, Teagle Conference for Integrative Learning, 1 – 2 OCT, Moravian College (PA).

“Engaging the Unengaged: Bio-contextualized Physics Lab” (2010), Invited Oral with D.B. Poli and M. Rearick, Institutionalizing Integrative Learning: Faculty Development, Course Development & Assessment, 16–20 JUN, Roanoke College (VA).

“Having Your Cake and Eating Too: Student Engagement and Collaborative Faculty Development” (2010), Contributed Oral with M. Rearick and D.B. Poli (~30% acceptance), Lilly National Conference on College and University Teaching, 4–6 FEB, Greensboro (NC).

“Collaborative Teaching Grants: Faculty Development for Integrative Teaching and Learning” (2009), Contributed Oral with D. Sarabia and A. Bloss (~30% acceptance), American Assoc. of Colleges & Universities, 22–25 OCT, Atlanta (GA).

“Two Birds, One Stone: Integrating Biology Within the Physics Laboratory” (2009), Contributed Poster with D.B. Poli and M. Rearick, Annual Elon Teaching and Learning Conference, 15 AUG, Elon University (NC).

– Accepted External, Refereed Proposals:

2019, “Lilly STEM Initiative for Mid-Career Faculty”, Lilly Faculty Fellows Program– co-PI, with M. P. Rearick, \$25K.

2018, “Micro-Raman Spectrometer for Materials Science Research”, Claude Moore Charitable Foundation– co-PI, with R. Balasubramanian & J. Bradley, \$25K.

– Referee, Peer-Reviewed Journal:

American Journal of Physics, *Science Education*, *Global Education Review*, *The Physics Teacher*

SCIENTIFIC LITERACY FOR THE PUBLIC

– Completed Manuscript:

Fleenor, M. C. (2020), *Blue Star, New Star*; children’s emerging reader, Archway Publishers.

– Accepted Refereed Publication:

Fleenor, M. C. (2018), “Faith Seeking Understanding’ as an intellectual approach to 21st c. Cosmology”, *Perspectives on Science and Christian Faith*, **71** no. 3, 153–159.

Fleenor, M. C. (2015), “The Ways of Jesus and Science at an IVGCF Meeting”, *Perspectives on Science and Christian Faith*, **67** no. 4, 272–276.

– Presentations:

“Creation as the Wound of God” (2019), Contributed Paper (~ 75% acceptance), Ian Ramsey Centre Summer Conference, 20 JUL, Oxford, UK

–Invited Lectures in Astronomy

2018–2007, Astronomy Elderhostel, Workshop Organizer– “Galaxies as Observational Building Blocks”, Mountain Lake, VA; 3 hour interactive discussion on the nature of the universe.

2017, 2011, 2009, Roanoke College Elderscholar, ~ 60 older adults; less-technical

2017, “What is a Solar Eclipse Ambassador?”

2011, “Counting Planets: What Makes Extrasolar Planets Count”

2009, “How Astronomers Move from Observation to Interpretation”

2013, “Multi-wavelength Astrophysics: How Non-optical Light Informs Our Understanding of the Universe,” TriStar Astronomy Conference, 2 MAR, Greensboro, NC; more technical

2011, “Grand Unification: Aspiring to a Congruent Life with Integrity”, Faith & Reason Series, faculty-wide attendance; less technical

2010, “Large-scale Astronomical Environments and Their Influences on Star Formation”, Virginia Association of Astronomical Societies Annual Meeting; more technical

2009, “Collective Memories of the 20th Century: Robert A. Millikan and the enigma of scientific discovery”, President’s Forum Speaker, faculty-wide attendance ; interdisciplinary, more technical