

Biographical Sketch: Emilia A. Chaska

Physical Scientist Goddard Space Flight Center, Building 21 8800 Greenbelt Road Greenbelt, Maryland 20771, 555-867-5309, eachaska@nasa.com

A. Professional Preparation

Dr. Chaska is a scientist and applied physicist at the Goddard Space Flight Center with expertise gamma ray fundamental physics, gamma ray instrument calibration and experimentation. Their education is:

Ph.D., Physics	University of North Oklahoma, 2006
M.S., Applied Physics	University of North Oklahoma, 2002
B.S., Physics	East Dakota State College, 2000

During their graduate studies, Dr. Chaska has utilized their skills at the University of North Oklahoma to support the calibration of the Mars Instrument for Molecular and Elemental Analysis (MIMEA) on the Mars Enthusiasm Rover. They also worked as a teaching assistant in the Department of Physics and was funded by an NSF graduate fellowship. As a postdoctoral scholar at the University of North Oklahoma, Dr. Chaska was also responsible for the development and delivery of a new undergraduate course in techniques of geological sample composition analysis.

At the Goddard Space Flight Center, Dr. Chaska was responsible for developing the elemental calibration for the Mars Instrument for Gamma Ray Analysis (MIGRA) on ROSY Rover and now supports its operations on Mars. Dr. Chaska has also participated in the integration and testing (I&T) phase of MIGRA's engineering process at Goddard. During this phase Dr. Chaska provided support to the engineering team by defining test protocols, success criteria and analytical support for instrument performance data. Dr. Chaska's recent efforts are to enhance the existing MIGRA flight unit elemental calibration and to develop new forms of in situ gamma ray technology that meet the evolving needs of modern missions to other planets.

B. Appointments

2012–present	<u>Scientist</u> in the Terrestrial Planets Group, Planetary Sciences Section – Goddard Space Flight Center, Greenbelt, MD
2009-2012	<u>Goddard Postdoctoral Scholar</u> – Goddard Space Flight Center, Greenbelt, MD
2006–2009	<u>Postdoc Scholar</u> - University of North Oklahoma, Department of Physics
2006-2008	<u>Sessional Lecturer</u> in Physics – University of North Oklahoma
2002-2006	<u>Graduate and Teaching Assistant</u> – University of North Oklahoma, Department of Physics
2000-2002	<u>Graduate Assistant</u> – University of North Oklahoma, Department of Applied Physics

C. Significant Publications

Vargas, S.J., Brown, R.J., Gugler, G.H., Chaska, E.A., chapter title: Ex-Vivo Gamma Ray Analysis in Planetary Exploration, accepted for publication in book: Advances in Planetary Spectroscopy, publisher: The Royal Society of Physics, 2022

- Chantal C. Harrison et al., MIGRA: Mars Instrument for Gamma Ray Analysis, *Advances in Space Science Reviews*, **22** (21) 252 – 279.
- Harrison, C.C., Romero, P.H., Flannigan, L.E., Horowitz, A.J. and Chaska, E.A., Analysis of Graphite from Northern Labrador *Nature* **222** (2019) 64 – 72.
- Chaska, E.A., Elm, K.T., Flannigan, L.E. and Harrison C.C., Elemental Calibration in the Development of MIGRA for Mars Exploration, *Journal of Gamma Ray Analysis* **3** (2018) 1622 – 1625.
- Iona, S.L., Flannigan, E.L., Chaska, E.A., Tucker, D.P., and Wilson, K.W., Gamma Ray Analysis of Geological Compounds, *Advances in Gamma Ray Analysis* **12** (2018) 129 – 152.
- Campbell, I.H., Garcia, B.M., Chaska, E.A., and Momoa, L.C., MIMEA Calibration Over Time on Mars *Nuclear Instruments and Methods* **68** (2018) 38 – 44.
- Fisher, C.X., Chaska, E.A. and Campbell I.H., Composition Database Development for Gamma Ray Elemental Composition Analysis, *Nuclear Instruments and Methods*. **85** (2018) 6 - 17.
- Chaska, E.A., Campbell I.H. and Smithfield, G.K., Refining Microscale Gamma Ray Analysis of Geological Samples. *Geological Instrument Development* **362** (2016) 420 – 450.
- Chaska, E.A., Parsons, I.G., and Campbell I.H. Mass Attenuation Coefficients in MIMEA Gamma Ray Analysis *Advances in Gamma Ray Science*. **4** (2015) 3352 - 3368.
- Hope, T.L., Chaska, E.A., Campbell, I.H., and Schmidt, M.P., Strontium Composition Analysis Using Gamma Ray Spectroscopy. *Gamma Ray Spectroscopy*. **125** (2014) 297 - 313.

D. Examples of Synergistic Activities

- Publication Referee for Journals: *Advance in Gamma Ray Science*, *Gamma Ray Spectroscopy*, and *Space Instrument Development*.
- Involved in collaborative research activities totaling more than \$1,000,000.
- Involved in software development for automation of data analysis from MIGRA that can be extended to other flight instruments.
- Principal Investigator for a NASA grant involving Johnson Space Center, the Jet Propulsion Lab and 5 universities.
-

E. Collaborators and Other Affiliations

- i. Collaborators: Bruno Garcia (North Virginia State), Leslie Flannigan (University of Europe), George Gugler (CSUNY), Paul Romero (University of East Alaska), Samantha Vargas (Iceland Technical Institute), Ryan Brown (NASA)
- ii. Advisors: PhD – Iris H Campbell, University of North Oklahoma, Postdoctoral – Chantal Harrison, Goddard Space Flight Center
- ii. Advisees: advising or have advised 6 postdocs and 4 PhD students at Goddard Space Flight Centers thus far.