GREGORY J. BRUNNER

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PROFILE

Mr. Brunner is an imagery and 3D subject matter expert and Python developer for Esri's Professional Services team. He works in close collaboration with Esri's 3D and imagery teams on innovative research and development projects that involve 3D feature extraction, image analysis, content quality assessment, and 3D augmented reality. He also composes creative presentations and software demonstrations for Esri.

EXPERIENCE

Imagery Scientist — Esri, St. Charles, MO — July 2011 – Present

Led effort to develop a framework to evaluate large amounts of geographic content. Developed Python tools to automate content assessment. Developed imagery processing pipeline that extracted 3D pointclouds from oblique aerial photos. Has presented at numerous conferences on topics including, but not limited to 3D augmented reality, imagery analysis, and geographic data quality.

Associate Scientist — Sensing Strategies, Inc., Pennington, NJ — March 2008 – July 2011

Developed algorithms for the analysis of space-based and ground-based sensor data in MATLAB. Implemented algorithms in data analysis software written in C++. Designed user interface for viewing sensor data. Implemented geographic information system software TatukGIS and Google Maps in graphical user interface for analyzing sensor data. Performed analysis on LiDAR sensor data. Constructed images from sensor data. Calibrated sensors in laboratory. Participated in field tests of remote sensing equipment.

Graduate Student Researcher — Rice University, Houston, TX — June 2005 – March 2008

Completed multiple astronomy research projects in collaboration with scientists across the world that led to publications and conference presentations. Developed computational algorithms to analyze large volumes of spectral data. Composed a research grant and received approval from Spitzer Science Center and the NASA Jet Propulsion Lab.

Visiting Research Fellow — Spitzer Science Center, Caltech, Pasadena, CA — Aug. 2006 – Feb. 2007

Worked with *Spitzer Space Telescope* Infrared Spectrograph instrument team to develop data reduction pipeline that decomposes spectroscopic data cubes into maps. Wrote paper summarizing our analysis of spectra from nearby galaxies.

EDUCATION

Rice University, Houston, TX
M.S., Physics, 2008

Johns Hopkins University, Baltimore, MD
B.S., Physics, 2005
Minor in Earth and Planetary Science

PROFESSIONAL AFFILIATIONS

Association for Unmanned Vehicle Systems International, AUVSI (2014 - Present)
The American Society for Photogrammetry and Remote Sensing, ASPRS (2011 - Present)
ASPRS Heartland Region Director (2015 - present)
ASPRS Heartland Region President (2013 - 2014)
The American Astronomical Society (2006 - 2011)

COMPUTER SKILLS

Extensive knowledge of software for Windows, Mac OS X, UNIX, and Linux.
Proficient programming skills in C, C++, Python, MATLAB, and IDL.
Expert with commercial GIS software such as Esri ArcGIS and TatukGIS.

SELECTED PRESENTATIONS

Thunder Up! Mapping Russell Westbrook's Shots with Python and ArcGIS. Oklahoma South Central ArcGIS User Group. Oklahoma City, OK. September 2016.

Global Data Management Using Content Suitability Indicators. 2016 Esri International User Conference. San Diego, CA. July 2016.

Writing Image Processing Algorithms with the Python Raster Function. 2016 Esri Developer Summit. Palm Springs, CA. March 2016.

What's the State of the Data? 2015 Esri International User Conference. San Diego, CA. July 2015.

GeoPlanner for ArcGIS: An Overview. 2015 Esri Federal User Conference. Washington DC. February 2015.

Not a Web-Developer? Not a Problem! Using Open, Free, Configurable GIS Web-Applications to Jumpstart Your GIS Application Development Project. ASPRS 2014 Annual Conference. Thought Leader Presentation. Louisville, KY. March 2014.

Managing Airport Airspace Using 3D Augmented Reality. Air Traffic Controllers Association International Conference. Amsterdam, the Netherlands. March 2013.

Graduate Education and Careers in Science. Holy Ghost Preparatory School Senior Career Day. Bensalem, PA. October 2008, 2009, and 2010.

Mapping the Spatial Distribution of H_2 and PAH Emission in Nearby Galaxies with the Spitzer IRS. 211^{th} meeting of the American Astronomical Society. Austin, TX. January 2008.

Mapping the Spatial Distribution of Warm H_2 in Nearby Galaxies with the Spitzer IRS. Spitzer Conference on the ISM in the Milky Way and Nearby Galaxies. Pasadena, CA. December 2007.

Mapping Ne, S, and H_2 across M51 with the Spitzer IRS. Deep Spectroscopy and Modeling of Nebular Emission Workshop. Beijing, China. April 2007.

Spitzer IRS Spectral Maps of Spatially Resolved Molecular Hydrogen in NGC5194. 209^{th} Meeting of the American Astronomical Society. Seattle, WA. January 2007.

PUBLICATIONS, CONFERENCE PROCEEDINGS, AND PRESS RELEASES

Mapping the Spatial Distribution of Warm H_2 in Nearby Galaxies with the Spitzer Infrared Spectrograph. **Brunner, G.**, Dufour, R., Sheth, K., Armus, L., Wolfire, M., Vogel, S., and Schinnerer, E. 2009. The Evolving ISM in the Milky Way and Nearby Galaxies.

Observations of M33 H II Regions: The Ne/S Ratio, Metallicity, and Ionization Variations. Rubin, R.H., Simpson, J.P., McNabb, I.A., **Brunner, G.**, Colgan, S.W.J., Dufour, R., Pauldrach, A.W.A., Browne, A.D., Zhang, R., and Csongradi, E.J. 2009. The Evolving ISM in the Milky Way and Nearby Galaxies.

Warm Molecular Gas in M51: Mapping the Excitation Temperature and Mass of H_2 with the Spitzer Infrared Spectrograph. **Brunner, G.**, Sheth, K. Armus, L., Wolfire, M., Vogel, S.N., Helou, G., Dufour, R.J., Smith, J.D.T., and Dale, D.A. 2008. The Astrophysical Journal. 675, 316.

Spitzer Finds Cosmic Neon's Sweet Spot. Rubin, R., Simpson, J., Colgan, S., McNabb, I., Erickson, E., Haas, M., Citron, R., Dufour, D., **Brunner, G.**, Pauldrach, A. 16 May 2008. http://www.spitzer.caltech.edu/Media/happenings/20080516/

Spitzer Observations of M33 and the Hot Star, HII Region Connection. Rubin, R.H., Simpson, J. P., Colgan, S. W. J., Dufour, R. J., **Brunner, G.**, Ray, K. L., Erickson, E. F., Haas, M. R., Pauldrach, A. W. A., and Citron, R. I. 2008. The Monthly Notices of the Royal Astronomical Society. 387, 45.

REFERENCES

Available upon request