

3 Biography and Sketches

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Role on Proposal: Principal Investigator

Responsible for proposal preparation, observation scheduling with K2 team & data analysis/archiving.

Experience Related to the Investigation:

Dr. Golden has extensive experience in the acquisition and analysis of time-resolved astronomical image data - for his Ph.D. he used a spare HST/STIS MAMA camera to observe faint ($V \sim 24$) pulsations from two optical rotation-powered pulsars (Geminga & PSR B0656+14) as well as studying the Crab pulsar's optical emission at $\sim \mu\text{sec}$ resolution. Subsequent work involved the development of a high speed CCD imaging system (GUFU, detailed below) and its installation at two medium sized observatories to study milli-mag variations in optical/I band emission from several nearby fast rotating (\sim hours) brown dwarfs over monthly baselines. Dr. Golden has prior experience of K2, having been awarded SC time (GO1011) during Campaign 1 to try and discern modulated optical emission from a faint T5.5 brown dwarf (although unsuccessful, access to the excellent K2 analytic software made the data analysis an excellent intern summer project.)

Education:

- National University of Ireland, Galway – Ph.D., Astrophysics, 1999
- Queens University of Belfast – M.Sc., Computational Science, 1993
- Dublin University, Trinity College – B.A.(Mod.), Natural Sciences, 1991

Professional Positions and Experience:

- Visiting Scientist, Dept. of Astrophysics, American Museum of Natural History, New York, 2014-present
- Associate Professor, Dept. of Mathematical Sciences, Yeshiva University, New York, 2013-present
- Associate Professor, Dept. of Genetics, Albert Einstein College of Medicine, Bronx, 2011-present
- University Lecturer, School of Math., Stats. & App. Math., National University of Ireland, 2009-2011
- Visiting Astronomer, Paris Observatory, Paris, France, 2004
- Visiting Astronomer, National Radio Astronomy Observatory, 2003
- Visiting Professor, Centre for Astronomy, University of Porto, Portugal, 2002-2004
- University Lecturer, College of Engineering & Informatics, National University of Ireland, 1999-2009

Astronomical & Space Science Experience:

Instrumentation: Lead development of Galway Ultra Fast Imager (GUFU) L3CCD imaging system (2008–2010), which used an Andor iXon back-illuminated CCD camera, with a readout time of $\sim 2\text{ms}$ and capable of obtaining 400 images/second. Designed and assembled at the Centre for Astronomy, NUI Galway. Funded by Science Foundation Ireland (07/RFP/PHYF553), currently visitor instrument at Vatican Advanced Technology Telescope, Mount Graham, AZ

Software: Supervised doctoral work of Stephen Bourke, who developed AIPSLite - an AIPS-based distributed processing environment for efficient analysis of TB scale radio interferometric datasets.

Observing Experience - Ground: Optical/IR telescopes include Gemini, ESO (VLT, 3.6m), Special Astrophysical Observatory (6m BTA), Mt. Palomar (Hale 5m), Isaac Newton Group (WHT, NOT, TNG), Mauna Kea Observatories (NASA IRTF, UKIRT, Keck), Mount Graham Observatory (VATT), Loiano Observatory (G.D. Cassini Telescope). Radio telescopes include NRAO (VLA, VLBA), Long Wavelength Array, NAIC (Arecibo), Jodrell Bank (Lovell Telescope, MERLIN), Mullard Radio Astronomy Observatory (Ryle Telescope), ASTRON (WSRT).

Observing Experience - Space: EUVE Program ID: 99-033, 'Characterization of the Isolated Neutron Star PSR B0656+14'

Honors/Awards:

- Asteroid 11451 officially named 'Aarongolden' by the IAU, 2001
- Education Abroad Program Scholarship to the Space Sciences Laboratory, UC Berkeley, 1998

Relevant Publications (last author position from 2006 are papers lead by former graduate students):

Hallinan, G., Littlefair, S. P., Cotter, G., Bourke, S., Harding, L. K., Pineda, J. S., Butler, R. P., **Golden, A.**, Basri, G., Doyle, J. G., Kao, M. M., Berdyugina, S. V., Kuznetsov, A., Rupen, M. P., Antonova, A. 'Magnetospherically driven optical and radio aurorae at the end of the stellar main sequence'. *Nature* 523, 568-571, 2015.

Harding, L.K., Hallinan, G., Boyle, R.P., **Golden, A.**, Sheehan, B., Zavala, R.T., Butler, R.F. 'Periodic Optical Variability of Radio Detected Ultracool Dwarfs' *Astrophysical Journal*, 779, 1:21 21, 2013.

Harding, L.K., Hallinan, G., Konopacky, Q.M., Boyle, R.P., Butler, R.F., **Golden, A.** 'Spin-orbit alignment in the very low mass binary regime: The L dwarf tight binary 2MASSW J0746425+200032AB' *Astronomy & Astrophysics*, 554A, 113, 2013.

Bourke, S., van Langevelde, H.J., Torstensson, K., **Golden, A.** 'An AIPS-based Distributed Processing Method for Large Radio Interferometric Datasets' *Experimental Astronomy*, Volume 36, Issue 1-2, pp 59-76, 2013.

Oosterbroek, T., Gognard, I., **Golden, A.**, Verhoeve, P., Martin, D.D.E., Erd, C., Schulz, R., Stuewe, J.A., Stankov, A., Ho, T. 'Simultaneous Absolute Timing of the Crab Pulsar at Radio and Optical Wavelengths', *Astronomy and Astrophysics*, 488, 271, 2008.

Lane, C., Hallinan, G., Zavala, R.T., Butler, R.F., Boyle, R.P., Bourke, S., Antonova, A., Doyle, J.G. Vrba, F.J. **Golden, A.**, 'Rotational Modulation of M/L Dwarfs due to Magnetic Spots', *Astrophysical Journal*, 668, L163, 2007.

Hallinan, G., Bourke, S., Lane, C., Antonova, A., Zavala, R.T., Briskin, W.F., Boyle, R.P., Vrba, F.J., Doyle, J.G., **Golden, A.**, 'Periodic Bursts of Coherent Radio Emission from an Ultracool Dwarf', *Astrophysical Journal*, 663, 25, 2007

Hallinan, G., Antonova, A., Doyle, J.G., Bourke, S., Briskin, W.F., **Golden, A.** 'Rotational Modulation of the Radio Emission from the M9 Dwarf TVLM513-46546: Broadband Coherent Emission at the Substellar Boundary?', *Astrophysical Journal*, 653, 690, 2006

Forde, K.P., Butler, R.F., Peat, D., **Golden, A.**, O'Tuairisg, S., 'Spectrophotometry: imaging with custom narrow-band filters and an automated data-reduction pipeline', Proceedings of the SPIE, Vo.5823, p 216, 2005

Cunniffe, J., **Golden, A.**, G Simon, G., 'Self-Consistent Data Quality Recovery - A Study of the DENIS Photometric Calibration Archive', Proceedings Astronomical Data Analysis Software and Systems XV, October 2-5, 2005, San Lorenzo de El Esorial, ASP Conference Proceedings, Vol. 351. San Francisco: Astronomical Society of the Pacific, 2004., p.812

Shearer, A., Stappers, B., O'Connor, P., **Golden, A.**, Strom, R., Redfern, M., & Ryan, O., 'Enhanced Optical Emission During Crab Giant Radio Pulses', *Science*, 301, 493, 2003

Butler, R., O'Tuairisg, S., Shearer, A. & **Golden, A.**, 'Image PSF-matching and subtraction: a powerful astronomical technique and its application to industry', Proc. *SPIE*, Vol. 4877, p.201-212, 2003.

Butler, R. F., **Golden, A.** & Shearer, A., 'Detection of new optical counterpart candidates to PSR B1951+32 with HST/WFPC2', *Astronomy & Astrophysics*, v.395, p.845-851, 2002