

## Curriculum Vitae

### Lou Nigra

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**BACKGROUND:** Prior to starting a full-time effort toward an Astronomy Ph.D. in 2003, I had a successful career as an Electrical Engineer, concentrating on radio frequency circuits and systems, with deep exposure to diverse areas within that field.

#### EDUCATION:

Ph.D. Astronomy, University of Wisconsin, Madison, 2012  
M.S. Physics, University of Illinois at Chicago, 2005  
M.S. Electrical Engineering, Washington State University, Pullman, 1977  
B.S. Electrical Engineering at University of Nebraska, Lincoln, 1974

#### RESEARCH INTERESTS:

The origin and evolution of structure in the ISM; active Radio Frequency Interference mitigation techniques for radio telescopes; high performance baseline removal in radio telescope data and advanced signal extraction techniques.

#### RESEARCH EXPERIENCE:

##### University of Wisconsin, Madison:

*Research Assistant, 2009-2011: **Magellanic Stream to Halo interface.*** Advisors: Snežana Stanimirović, J. S. Gallagher, III.

*Pre-doctoral Appointment, 2009: **Active cancellation of the GPS L3 signal in radio telescopes.*** Performed at National Astronomy and Ionosphere Center (NAIC), Arecibo, Puerto Rico. Advisors/Supervisors: B. Murray Lewis (NAIC), Ganesan Rajagopalan (NAIC), Snežana Stanimirović

*Research Assistant, 2006-2008: **Study of star-forming region NGC602 in the Small Magellanic Cloud.*** Advisor: J. S. Gallagher, III.

*Research Assistant, 2005-2006: **IDL Simulation software for a MEMs-based active optics subsystem.*** Advisor: Andrew Sheinis.

**University of Illinois at Chicago:**

*Masters Research, 2004-2005: Analysis and performance evaluation of a low-cost educational cosmic ray shower telescope:* Advisor: Mark Adams.

*Summer Intern: 2004: Testing tracker “rods” destined for Compact Muon Spectrometer (CMS) at CERN, 2005: Tutorials for CMS simulation software.* Fermi National Accelerator Laboratory (FNAL). Supervisor: Daniel Elvira, Advisor: Cecilia Gerber (UIC)

**REFEREED PUBLICATIONS:**

“Probing the Structure and Kinematics of the transition Layer between the Magellanic Stream and the Halo in HI”, Nigra, L., Stanimirović, S., Gallagher, J. S., III, et al. 2012, *The Astrophysical Journal*, submitted

“The Small-Scale Structure of the Magellanic Stream as a Foundation for Galaxy Evolution”, Stanimirović, S., Gallagher, J.~S., III, & Nigra, L. 2010, *Serbian Astronomical Journal*, 180, 1

“The 200° Long Magellanic Stream System”, Nidever, David L.; Majewski, Steven R.; Butler Burton, W.; Nigra, Lou, 2010, *The Astrophysical Journal*, Volume 723, Issue 2, pp. 1618-1631

“NGC 602 Environment, Kinematics and Origins”, Nigra, L.; Gallagher, J. S., III; Smith, L. J., et al., 2008, *The Publications of the Astronomical Society of the Pacific*, Volume 120, Issue 871, pp. 972-982

**CONFERENCE PROCEEDINGS**

“A turn-key Concept for active cancellation of Global Position System L3 Signal”, Nigra, L., Lewis, M., Edgar, C., et al. *Proceedings of the RFI Mitigation Workshop*. 29-31 March 2010. Groningen, the Netherlands.

“The Magellanic Stream to Halo Interface: Processes that Shape our Nearest Gaseous Halo Stream”, Nigra, Lou; Stanimirović, S.; Gallagher, J. S., III, et al. 2010, *Galaxy Wars: Stellar Populations and Star Formation in Interacting Galaxies*, 423, 38.

“MEMs-based speckle spectrometer”, Sheinis, A. I.; Nigra, L. ; Kuhlen, M. Q., *Advances in Adaptive Optics II*, *Proceedings of the SPIE*, Vol 6272. pp. 62724U, 2006 (arXiv:astro-ph/0606179).

## **HONORS & AWARDS**

Wisconsin Space Grant Consortium Graduate Fellowship 2010-2011

Nominee: UW-Madison Exceptional Service TA Award 2012

## **TEACHING EXPERIENCE:**

*Teaching Assistant: Spring 2008. University of Wisconsin - Madison: 6 discussion sections, tutoring: Astronomy 103, Intro to Astronomy, Dr. Trevor Irwin.*

*Teaching Assistant: Fall 2007: University of Wisconsin - Madison: 3 discussion sections, 3 labs & tutoring: Physics 104, Intro Physics Non-Majors, Prof. Clint Sprott.*

*Teaching Assistant: Fall 2005. University of Wisconsin - Madison: 6 discussion sections, tutoring: Astronomy 103, Intro to Astronomy, Prof. Amy Barger.*

*Teaching Assistant: 2004-2005: University of Illinois at Chicago: Two introductory physics labs each of four semesters. General Physics tutoring duty at Science Café.*

## **OUTREACH:**

Astronomy department volunteer outreach coordinator for 2010-2011 term.

Since January, 2011, write & present weekly 4-minute radio feature, "Radio Astronomy" at end of Tuesday "In Our Backyard" program on community radio WORT-FM 89.9.

Miscellaneous Outreach:

- Solar telescope demonstration at Wisconsin State Fair UW Space Place booth.
- Interactive stellar spectra demonstration at Lodi Elementary School science fair.
- Stargazing party with slide show, talk and demonstrations of stellar twinkling and light scattering for elementary school audience at Madison Country Day school.
- Hosted public viewing sessions at Washburn Observatory 3 to 5 nights per year.
- Worked with High School students/teachers including talk on directional cosmic ray measurements with low-cost detectors at University of Illinois at Chicago.
- Replied to inquiries from the public at UW, notably detailed replies to interview questions for student projects on time travel and Supernovae.

**ENGINEERING CAREER:**

I continuously worked as an Electronics Engineer from 1977 to 2003 for commercial and defense companies in the field of radio frequency systems design and development of RF systems and circuits operating from 10 kHz through 8 GHz. This has included management, supervisory, mentor and technical staff positions.

**ENGINEERING EXPERIENCE:**

Rockwell-Collins: 1977-1980. Engineer: Radio Frequency navigation aids design and development. This included GPS work.

Northrop-Grumman Corporation: 1980-1982. Engineer: Radar Electronic Countermeasures receiver subsystem R&D.

Zenith: 1982-1983. RF Engineer: Cable television converter development.

Sonicraft, Inc.: Supervisor Analog Design. 1983-1986. VLF/LF and VHF communications equipment analog design for defense and FAA.

Northrop-Grumman Corporation: 1986-1992. Manager Receiver Group: Radar Electronic Countermeasures receiver subsystem R&D.

Motorola Cellular Subscriber Division: 1992-2003. Distinguished Member of Technical Staff: Subscriber handset transceiver circuit & system design, development from baseband DSP through antenna. Integrated circuit hardware architecture development, including location technologies such as GPS.

**U.S PATENTS:**

6,157,271 "Rapid tuning, low distortion digital direct modulation phase locked loop and method therefor"

7,043,208 "Method and apparatus to reduce interference in a communication device"

7,116,951 "Transmitter circuit and method for modulation distortion compensation"

7,532,696 "Calibration device for a phased locked loop synthesiser"