

University of Maryland, Dept. of Astronomy
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CURRENT POSITION

Dept. of Astronomy, University of Maryland, Research Associate 5/06–present

EDUCATION

Columbia University, New York, Ph.D. in Astronomy 10/95

Dissertation Title: “The Shape of Dark Matter Halos”

Dissertation Adviser: Professor Jacqueline van Gorkom

Columbia University, New York, M.Phil. in Astronomy 10/93

Groningen University, the Netherlands, M.Sc. in Astronomy 7/86

HONORS AND AWARDS

USRA’s ”Navy Programs Programmatic Excellence Award (2002)”

RESEARCH EXPERIENCE

Thirty years Research, Analysis & Software Experience in handling medium-sized catalogs and (hyperspectral) image products.

University of Maryland, Visiting Research Associate 02/2011–present

- “Millimagnitude Millimagnitude Photometry and submilli arcsecond Astrometry of Stars and Galaxies in the Kepler Field.” A submitted “Kepler Participating Scientist” proposal.
- Collaborate with Th. Kouwenhoven on new wide-binary projects
- Collaborate with G. Marcy, Dave Latham and Gerald Cecil to obtain radial velocities of the very-wide binaries recently discovered (Shaya & Olling).

University of Maryland, Research Associate 05/2006–01/2011

- ”Millimagnitude Variability of Galaxies in the Kepler Field” Submitted Kepler Cycle 3 proposal
- ”Re-Use of the Deep Impact Flyby Spacecraft as an NEO-Finding Observatory”
Submitted NASA pre-proposal (PI, A’Hearn).
- ”Wide Binaries and Escaped Binary Components in the Solar Neighborhood”
Submitted NSF proposal & 2011 ApJS paper.
- ”Astrometry of Stars & Galaxies in the Kepler Field” “Awarded” Kepler Cycle 2 grant.
- “The GALEX Extragalactic Star (GES) Catalog: a multi-wavelength investigation of extragalactic stars resolved by GALEX.” Awarded GALEX Cycle 6 grant.
- FIVE White Papers for the ASTRO 2010 Decadal Survey, **ONE first author:**
“An Era of Precision Astrophysics: Connecting Stars, Galaxies and the Universe”
- Contributor to the “SIM Book,” (Ch. 6 & 10.1)
- Member of the SIM/GAIA Synergy Group
- Extra-galactic Astrometry: Member of the SIMDOG SIM Key Project (PI, Shaya)
- How to detect Solar-System Analogs amongst other stars
(White Paper for ExtraSolarPlanet Task Force & **SIM Science Studies Research Grant**)
- The importance of H_0 for characterizing dark energy

- Astrometric distance determination of external galaxies to 1%
(White Paper for ExtraSolarPlanet Task Force & **SIM Science Studies Research Grant**)
 - HI -based self-consistent mass models of the Milky Way
- University of Maryland**, Visiting Research Associate and **USRA** 9/05–04/06
- Studies of binarity among Hipparcos stars
 - Dark Matter Halo Shapes from Flaring Gas Layers
- USRA**, Research Scientist 9/05–1/06
- Analyze 2MASS Red-Clump stars to determine R_0 (**NASA/ADP grant**; 09/05 – now)
 - Preliminary design for a MIDEX-class space mission to identify 10,000 transiting planets
- USRA/USNO**, Research Scientist 9/00–9/05
- Critical participant in dispersed Fourier Transform Spectroscopy project (PI Hajian)
 - Many aspects of proposed US astrometric missions
 - Draft of substantial part of the science case for the AMEX & OBSS missions
 - Minimize overlap with ESA’s GAIA mission
 - Starformation and assembly history of the Milky Way: “near-field cosmology.”
 - Content of OBSS catalogs as a function of magnitude and astrometric accuracy
 - Temporal characteristics of the FAME, AMEX and OBSS missions
 - Discovered OBSS’ utility in discovering transits of extra-solar giant planets
 - OBSS’ capability to discover a significant number of potentially hazardous asteroids
 - Participated in USNO’s TPF activities
 - Astrometric signatures of binarity in the Hipparcos catalog.
- Rutgers University**, Postdoctoral Researcher (8/98-1/00) and Research Associate 1/00–7/00
- Large-scale software development: reduce and analyze HST-STIS spectroscopy
 - Three Space Interferometry Mission grant proposals:
 - Unraveling the inter-relations between luminous, dusty and dark matter in M31
 - The time-evolution of the disk-halo conspiracy: rotation curves of high-redshift galaxies
 - HI widths and kpc-scale structure in galactic dark matter distributions
 - HI gas layer widths and the shape of dark matter halos
 - Disk mass of NGC 2403 from stellar velocity dispersions and HI width measurements
 - The radial density profiles of luminous and dark matter in spirals
- Southampton University**, Postdoctoral Research Fellow 10/95–8/98
- Determined the Galactic constants from Oort constant constraints [$R_0 \sim 7.1$ kpc]
 - Determined the shape (almost round) of the Milky Way’s dark matter halo
 - Use self-consistent mass models to predict μ -lensing rates towards the Galactic bulge
 - Determined the Oort constants from the Tycho/ACT catalogue
- Columbia University**, Dissertation Research 1/90–9/95
- Developed new methods to determine the thickness of the gas layer from the full HI spectral line cube.
 - Developed self-consistent mass models to determine the shape of dark matter halos.
 - Found that NGC 4244’s dark halo is extremely flattened
- NRAO**, Socorro, Visiting Researcher Summers of 1991–1994
- Acquired, reduced and analyzed VLA HI spectral line data
- Netherlands Foundation for Research in Astronomy**, Summer Research Fellowship 1990
- Data reduction of HI spectral line cubes

Space Research Organization of the Netherlands, Scientific Consultant 9/86–12/89
 - Designed and implemented software to extract spectra of faint and/or extended sources from the IRAS-LRS database

- Sorted LRS all-sky spectrometer data from time-based to POSS-based system

Groningen University, M.Sc. thesis 1984–1986

- Wrote software to analyze the IRAS point source catalogue

- Obtained long-slit and Echelle spectra of PN (candidates) at La Silla observatory (ESO)

- Determined IRAS-FIR fluxes for the “Polar Ring Catalogue”

OBSERVING EXPERIENCE

Optical Fourier Transform Spectroscopy: USNO’s 11 and 24” telescopes

Radio, VLA, HI spectral line synthesis imaging (PI, hundreds of hours on-site)

Mid Infra-red, IRAS low resolution spectrograph

Near Infra-red imaging, Calar Alto, 3.5m (CoI, 2 nights)

Optical spectroscopy ESO, 1m (long slit, 4 nights), ESO CAT (Echelle, 3 nights), WHT (long slit; PI 6 nights)

Optical imaging INT, 2m: BVR wide field imaging (PI, 3 nights)

FELLOWSHIPS

Columbia University, Research Fellowship 6/91- 9/95

Columbia University, Teaching Fellowship 1/90- 5/91

Netherlands Foundation for Research in Astronomy Summer Research Fellowship 1990

GRANT PROPOSALS (PI)

Selected:

UMd, 2010 (0 k\$). “Astrometry of Stars & Galaxies in the Kepler Field” **Olling (PI)** & Shaya; NASA/Kepler-GO2

UMd, 2009 (90 k\$). “The GALEX Extra-Galactic Star Catalog,” **Olling (PI)** & Shaya; NASA/GALEX-GI/Cy6

UMd, 2008 (75 k\$). “1% Luminosity-Independent Distances to Nearby Galaxies with the Rotational Parallax Technique,” **Olling (PI)** & Shaya; NASA/SIM Science Studies

UMd, 2008 (75 k\$). “Searching for Solar System Giant Analogs with SIM PlanetQuest,” **Olling (PI)** & Shaya; NASA/SIM Science Studies

USNO/USRA/UMd (156 k\$) 2004–2008, “Galactic Structure & Dynamics from 2MASS, Tycho-2 & UCAC-2” **Olling (PI)**, NASA/ADP

Pending:

UMd, 2011, “Millimagnitude Photometry and submilli arcsecond Astrometry of Stars and Galaxies in the Kepler Field,” **Olling (PI)**. NASA/Kepler Participating Scientist

UMd, 2011, “Millimagnitude Variability of Galaxies in the Kepler Field,” **Olling (PI)**, Shaya & Mushotzky; NASA/KEPLER-GO3

UMd, 2010, “Wide Binaries and Escaped Binary Components in the Solar Neighborhood” **Olling (PI)** & Shaya; NSF/AAG

GRANT PROPOSALS (CoI)

Selected:

USRA/USNO, 2003, The Origins Billion Star Survey (OBSS) mission. Johnston (PI), ..., **Olling (Co-I/science-team member)**. NASA/JPL's Origins Roadmap Program

Pending:

UMd, 2010, "Re-Use of the Deep Impact Flyby Spacecraft as an NEO-Finding Observatory"
A'Hearn (PI), **Olling** and 12 others; NASA/RFI for EPOXI reuse missions

ACADEMIC SERVICE**MNRAS/ApJ/ApJL/AJ/A&A/PASJ/PATT:**

Refereed 21 papers & 5 observing proposals	'98-present
Intel Science Talent Search: Outside review of student's entry	February 2011
NASA/ADP: Review grant proposal	August 2009
AAAS: Review contributions to the AAAS Science Journalism Awards	September 2005
AAS: Panel member that recommended speakers for the 2006 AAS Winter Meeting	Apr. 2006
NSF: Was asked to serve on a panel that reviews and ranks grant proposals to NSF	Feb. 2004
AAAS: Review contributions to the AAAS Science Journalism Awards	August 2003
USNO: Review papers for the internal Editorial Board	2002-2004
USNO: Organizing loosely-formatted (pizza-lunch) research talks	2002-2005
NSF: Served on a panel that reviews and ranks grant proposals to NSF	March 2002
Rutgers University: Organized local research seminars	Fall 1999
Southampton University: Organized colloquium series	Spring 1998
Swiss National Science Foundation: Reviewed grant proposal	1996
Columbia University: Grad. Student Advisory Council. Departmental student rep.	'91-'92
University of Groningen: Student representative to the Faculty Board	1984-85

SUMMARY OF PUBLICATIONS, PRESENTATIONS & PUBLICITY

- Eighteen refereed papers, of which **four single authored & 4 first author**
- Two papers in preparation
- Four White Papers for the 2010 Decadal Survey (1 first author)
- Three White Papers for the ExtraSolar Planet Task Force (2007; 2 single author)
- Five invited oral conference contributions
- One invited conference panelist
- **85** other papers, including: **4** White Papers for the 2010 Decadal Survey; **3** White Papers for the ExtraSolar Planet Task Force (2007); **11** OBSS Technical Memorandums; **14** FAME/AMEX Technical Memorandums; **53** conference presentations, including **10 conference talks**
- **Thirty-four invited Colloquia**
- Six public lectures
- Two press releases resulting in several newspaper articles
- Two radio interviews (BBC)

PRESENTATIONS**INVITED CONFERENCE TALKS**

- "Searching for Solar System Giant Analogs with SIM," JPL/NExSci 9/2008
- "1% Luminosity-Independent Distances to Nearby Galaxies with the Rotational Parallax Technique," JPL/NExSci 9/2008
- "Rotational Parallaxes," Michelson Science Center 5/2007
- "The Shape of Dark Matter Halos," Aspen 1/1999
- "The Flattened Dark Matter Halos of NGC4244 and the Milky Way," Heidelberg 9/1996

CONFERENCE PRESENTATIONS

- 1/11 217th AAS meeting, USA: **1 Poster Paper**
 - “Very Wide Binaries”
- 1/10 215th AAS meeting, USA: **1 Poster Paper**
 - “SIM Science Studies: Long-Period Planets & Rotational Parallax”
- 1/10 215th AAS meeting, USA: *Talk by Patterson* **Co-author**
 - “SIM Measurements Near and Far”
- 1/10 215th AAS meeting, USA: *Talk by Howard* **Co-author**
 - “SIM Science Studies to Enhance Planet-Finding and Characterizing Capabilities”
- 9/09 “The Milky Way and the Local Group - Now and in the Gaia Era,” **Talk**
 - “Precision Astrophysics: Connecting Stars, Galaxies & the Universe” (Heidelberg)
- 6/09 214th AAS meeting, USA: **1 Poster Paper**
 - “SIM Science Studies: Dynamics of Nearby Galaxies & Long-Period Planetary Systems”
- 1/09 213th AAS meeting, USA: **2 Poster Papers**
 - “Searching for Solar System Analogs with SIM”
 - “Rotational Parallax: A SIM Science Study”
- 5/08 STScI Symposium ”A Decade of Dark Energy,” **1 Poster Paper**
 - “Astrometry, Precision Astrophysics, H0 & (some) Cosmology:
 A Connection between Stars, Galaxies and the Universe”
- 1/08 211th AAS meeting, USA: **1 Poster Paper**
 - “The distance to the Galactic Center from Red Clump Giants”
- 1/06 207th AAS meeting, USA: **2 Poster Papers**
 - “The Milky Way: A Connection between Stars, Galaxies and the Universe”
 - “The Dispersed Fourier Transform Spectrometer - Toward Earth-Mass Planet Detection”
- 1/05 206th AAS meeting, USA: **1 Poster Paper**
 - “VLA Imaging of the SiO Maser Emission Toward AGB Stars:
 SIM PlanetQuest Preparatory Science”
- 10/04 Flagstaff, USA, “Astrometry in the Age of Large Telescopes;” **1 Poster Paper**
 - “Astrometric Binaries in the Age of the Next Generation of Large (Space) Telescopes”
- 5/04 Uni. of California, Berkeley, USA, “Wide Field Imaging From Space;” **1 Poster Paper**
- 1/04 203rd AAS meeting, USA: **1 Poster Paper**
 - “Binarity and the Fine-Print in the Hipparcos Catalogs:
 Revised Distance Scale?, More Binaries in the Solar Neighborhood”
- 10/03 Uni. of Maryland, USA, “The search for Other Worlds;” **1 Poster Paper**
 - “The AMEX Astrometry Mission: An Effective ExtraSolar Planet Finder”
- 6/03 Boston University Surveys of the Milky Way: **1 Poster Paper**
 - “Oort’s Constants Measured from Proper motions:
 Solid Evidence for an Asymmetric Galactic Potential”
- 1/03 201th AAS meeting, USA: **3 Poster Papers**
 - “Photometric Detection of Hot-Jupiters with a FAME-like Space Astrometry Mission”
 - “Precision Astrophysics with a FAME-like Space Astrometry Mission”

- "Stellar Mass-to-Light Ratios and Rotation Curves of Spiral Galaxies"
- 1/02 199th AAS meeting, USA: **2 Poster Papers**
 - "FAME Astrometry of Faint Objects and the Kinematics of the Galaxy"
 - "Full-sky Astrometric Mapping Explorer (FAME) Rescope Activities"
- 7/01 "Challenges for Photometry and Spectrometry with GAIA:" **Talk**
 - "FAME: Precision Astrometry, Photometry & Astrophysics"
- 2/01 WAS Winter meeting, USA **1 Poster Paper**
- 1/01 197th AAS meeting, USA **1 Poster Paper**
 - "One Percent Distances to Local Group Galaxies via Rotational Parallaxes"
- 6/00 196th AAS meeting, USA **2 Poster Papers**
 - "Dynamical modeling of M32 with stellar kinematics from STIS"
 - "Kinematical Results for NGC2841, NGC4552, and M87"
- 1/00 195th AAS meeting, USA **3 Poster Papers**
 - "Kinematical Black Hole Results for NGC2841, NGC4552, and M87"
 - "STIS Observations of the Center of M32"
 - "Oort's Constants Measured from the Tycho/ACT Catalogue"
- 9/99 "Black Holes in Binaries and Galactic Nuclei," ESO: **Talk**
 - "Black Hole Results from STIS"
- 6/99 194th AAS meeting, USA **2 Poster Papers**
 - "New Black Hole Results from STIS"
 - "The Origin of the Black Hole in M87"
- 7/99 "Galaxy Dynamics," Paris, France **1 Poster Paper**
 - "New Black Hole Results from STIS"
- 10/98 "Galactic Dynamics," Rutgers, USA **1 Poster Paper**
 - "The Shape of the Milky Way's Dark Halo"
- 1/98 191th AAS Meeting, USA: **Talk**
 - "The Case for a Leaner Milky Way"
- 7/97 "Galactic Halos," Santa Cruz, USA **2 Poster Papers**
 - "The Shape of the Milky Way's Dark Halo"
 - "Refining the Oort Constants: The Case for a Smaller Milky Way"
- 4/97 NAM, UK **1 Poster Paper**
 - "The shape of the Milky Way's Dark Matter Halo"
- 7/96 "Dark & Visible Matter in Galaxies & Cosmological Implications," Sexto/Italy **Talk**
- 4/96 NAM, UK **1 Poster Paper**
 - "The Highly Flattened Dark Matter Halo of NGC 4244"
- 1/96 187th AAS Meeting, USA **Thesis Talk**
 - "The Highly Flattened Dark Halo of NGC 4244"
- 1/95 185th AAS Meeting, USA **1 Poster Paper**
 - "Flaring gas layers : A tool to determine the shape of dark matter halos"
- 10/94 "Maryland Astrophysics Conference on Dark Matter," USA **1 Poster Paper**
 - "The Shape of the Dark Matter Halo of NGC 4244"
- 6/93 182th AAS meeting, USA **1 Poster Paper**
 - "The shape of the dark matter halo of NGC 4244"

- 6/92 “Teton Summer School on Astrophysics,” USA **1 Poster Paper**
 - “The Effects of Flaring in HI on the Observed Velocity Field of Spirals”
 89 Netherlands Astronomy Meeting **1 Poster Paper**

INVITED COLLOQUIA

- 5/09 GWU, Fairfax, VA ”Connecting Stars (their planets), Galaxies and the Universe in the Decade of Astrometry”
 3/09 PALS, College Park, MA “Astrometric & Photometric Detection & Characterization of (massive) Extrasolar Giant Planets”
 1/09 GSFC, Greenbelt, MA “Astrometric & Photometric Detection & Characterization of (massive) Extrasolar Giant Planets”
 10/07 NRAO Charlottesville/UVa, VA “Astrometry, Precision Astrophysics, H₀ & (some) Cosmology: Connecting Stars, Galaxies and the Universe”
 10/05 Uni. of Maryland, College Park, MD “Astrometry of the Milky Way & Co”
 3/01 Uni. of Maryland, College Park, MD “Size, Mass & Shape of the Milky Way”
 9/01 Uni. of Massachusetts, Amherst, MA “Size, Mass & Shape of the Milky Way”
 3/01 NRAO, Greenbank, WV “The Case for a Leaner Milky Way”
 5/00 Am. Museum of Nat. History, NY “The Case for a Leaner Milky Way”
 4/00 USNO, Washington “Size, Mass & Shape of the Milky Way”
 1/00 Berkeley “Size, Mass & Shape of the Milky Way”
 1/00 LLNL-IGPP “Size, Mass & Shape of the Milky Way”
 10/99 Rutgers University “The Shape of Dark Matter Halos”
 9/99 NRAO, Charlottesville “Size, Mass & Shape of the Milky Way”
 7/99 MPA, Heidelberg, Germany “Size, Mass & Shape of the Milky Way”
 2/99 Yale University “Size, Mass & Shape of the Milky Way”
 4/98 Princeton University 4/98 Columbia University
 4/98 STScI 2/98 Imperial College, UK
 1/98 OAN, Alcala, Spain 10/97 Rutgers University
 10/97 Uni. of Brighton, UK “The Shape of Dark Matter Halos”
 10/97 Uni. of Groningen, NL “The Shape of Dark Matter Halos” (SDMHs)
 5/97 IAP, Paris, France “SDMHs” 1/97 IAC, Tenerife, Spain “SDMHs”
 10/96 Uni. of Hertfordshire, UK “SDMHs” 6/96 Uni. of Durham, UK “SDMHs”
 5/96 Uni. of Groningen, NL “SDMHs” 5/96 Uni. of Liverpool, UK “SDMHs”
 2/96 NMSU, Las Cruces “SDMHs” 10/95 IAA, Granada, Spain “SDMHs”
 9/95 Columbia University “SDMHs” 1/95 NRAO, Socorro “SDMHs”

TEACHING EXPERIENCE

UMd: I the spring and fall of 2010, I taught ASTRO300, “Stars and Stellar Systems,” with an emphasis on “Stars.” The course is based on material from several textbooks, web resources, as well as a an “Observing Proposal” assignment for the students. For the proposal, the stundets presented a Notice of Intent (NOI) about two weeks before the proposal is due. Based on those NOIs, I (often) suggested to modify the proposals to more closely follow customary practise. The proposals were then evaluated both by me and by the students themselves (in a peer-review session).

In the fall of 2007, spring of 2008 and fall 2008, I taught ASTR220 (“Collisions in Space”) which is part of UMD’s CORE Physical Science (PS) program. This course is not open to astronomy majors but is appropriate for non-science majors. Roughly two-thirds of this class focused on: 1) collisions in the solar system, and 2) analysis of our planet’s fossil record in search of hard evidence for large impacts and the associated mass extinctions. The class also discusses collisions and mass-transfer between stars, collisions between galaxies and the resultant feeding of super-massive black holes. We did several in-class activities such as a crater-making experiment, watching asteroid/comet collisions with the Earth (Hollywood style), analysis of a popular-science television program on the subject of mass extinctions and a analysis in small groups of our “extinction book” (Night Comes to Cretaceous by J.L. Powell). Thus, this is a rather multidisciplinary course, and I enjoyed teaching it very much.

While I benefited immensely from notes provided by previous instructors, I made substantial additions to the lectures and even more need to be made to improve the class. For many classes I have incorporated “YouTube” videos on “The great Dying,” real and fake meteorite “impacts” and “base jumping.” I added new materials on several aspects on the extinction of species due to global forest fires, acid rain, and materials based on Martin White’s blog “Bad Science Journalism and the Myth of the Oppressed Underdog.”

In future classes, I want to cut back more on the pretty astronomical pictures (not easy for an astronomer) and spend more time on aspects related to the philosophy of science, how science is done in practice, and geology itself: all these aspects are quite nicely laid out in “Night Comes to Cretaceous”.

USNO/USRA: In the summers of 2001–2003 I helped a high-school student take the first steps on his journey to become a scientist. During these periods, we worked for several weeks on a research project in Galactic Astronomy employing archival astrometric and radial velocity data. At first, he used the web for literature searches and data retrieval, and learned/used IDL for quick analyses of the data. In the summer of 2002, the same student (now graduated from Cambridge University [UK]) compared model predictions with actual data (Monte Carlo techniques). In the summer of 2003 he wrote a Bayesian fitting program to interpret the data. The student is currently a graduate student at the University of Waterloo (CA). In the summer of 2005, I mentored a (freshman) student for the University of Michigan who participated in the USNO summer student program. He extracted Hubble Space Telescope images of quasars from the HST archives and evaluated whether these quasars were likely to be point sources and suitable for future SIM observations.

Rutgers University: While at Rutgers University, I participated for two years in a science education program which aims to bring hands-on astronomy to the classroom. This “Astro Nova” program *begin quote*, “... is part of the national Project ASTRO which creates long-term partnerships between astronomers and teachers or youth group and community leaders. The philosophy behind Project ASTRO is that students learn best when using hands-on inquiry-based activities Project ASTRO NOVA has trained over 200 teachers and over 120 astronomers and reached over 35,000 New Jersey students.” *end quote*. See <http://www.raritanval.edu/planetarium/astro/astronova.htm> for details.

As an astronomer, I was a resource for the teacher (in- and outside the classroom) and

provided students with the opportunity to have long-term interactions with a “real scientist.” The teacher taught a special-ed class, and I designed my presentations and experiments to fit the students’ needs.

Southampton University: In the spring of 1997 and 1998, I designed and taught part of “Physics of the Solar System”: an astronomy class for 2nd year science majors (based on “The new Solar System” by Beatty & Chaikin). We studied the Solar System through a range of activities such as student discussions, in-class Internet exploration and lectures.

Columbia University: Instructor for the lab section of Astronomy 101: introducing students to practical aspects of astronomy.

Groningen University: I completed a teacher-training program, and received a Teaching Certificate for high-school Physics. This course focused on methods of teaching physics, with emphasis on student lab work and classroom participation. As part of this course, I taught several groups of 13-18 year olds, designed and graded their exams.

EDUCATION AND PUBLIC OUTREACH ACTIVITIES

PUBLIC LECTURES

The National Capital Astronomers Open House: College Park, USA	10/09
Open House: Metzgerot Observatory, UMd, College Park, USA	1/09
Amateur Astronomers Association, Princeton, USA	12/98
American Museum of Natural History, New York, USA	10/98
Hampshire Amateur Astronomical Society, Southampton, UK	6/98
Amateur Astronomical Society of the Isle of Wight, UK	6/98

PUBLICITY & INTERVIEWS

“BBC World Service,” Radio Interview for “Discovery” (UK)	4/14/97
“BBC Solent,” Radio Interview (UK)	4/97
“El Pais” reported on: “3 Dimensional Structure of the Dark Matter” (Spain)	4/10/97
“Science Now” reported on: “The Milky Way’s Dark Shell” (USA)	4/9/97
“The Independent” reported on: “The Dark Side of the Milky Way” (UK)	4/9/97
“The Independent” Leading Article inspired by “...the enormously abstruse calculations disclosed yesterday in Southampton [by Olling & Merrifield] ...” (UK)	4/9/97
“Royal Astronomical Society,” Press Release (UK)	4/7/97

PRESS RELEASES

USNO Press Release, 2005 AAS Winter Meeting: “Star Companions Rule” **Olling R.P.**
 RAS Press Release, 1997: “Viewing the Milky Way through Dark Matter Glasses.”
http://ad.usno.navy.mil/~olling/Publicity/nam97_MW.html
Olling R.P., Merrifield M.R.

SCIENCE EDUCATION PROGRAMS

Outside referee for Intel’s Science Talent Search	2/2011
Project “ASTRO NOVA”	9/98-04/00
Woodrow Wilson Middle School, Edison, NJ. Bringing hands-on astronomy to the classroom (http://www.raritanval.edu/planetarium/astro/astronova.htm).	

PROGRAMMING & SYSTEM DEVELOPMENT EXPERIENCE

I have over thirty years experience in developing software and several pipeline-like data reduction systems for various data sets. I have worked extensively on image data, hyper-spectral data (radio “cubes”), spectra, catalogs, model development and general astrophysics problems. I have extensive experience in using (reading & writing) the Flexible Image Format (FITS) as related to the projects above.

A large part of the work I have done in my astronomical career involved the development of **new** software, both for my own research and as support for the astronomical community. The emphasis of my coding lies on the legibility, modularity, adaptability, portability and recycling of the routines. Typically, I use FITS as a standard data format for storing images and multi-dimensional data and ASCII tables for 1D results. In summary, I have extensive experience with designing (FORTRAN, C, PASCAL, IDL, SM) and using algorithms and image processing systems (AIPS, GIPSY, IDL).

Languages: IDL, Super Mongo (SM), FORTRAN/SHELTRAN, C, PASCAL

Data Reduction Packages: IDL, MIDAS, AIPS, GIPSY, GEISHA

Computer Hardware: Linux desktops, SUN desktops, VAX, DEC

Pipelines & Other projects:

UMd: HST/Kepler/GALEX/STEREO/Catalog	(194,500 lines)
USNO: FAME, Pipeline & Other	(175,000 lines)
USNO: dFITS, Pipeline	(26,000 lines)
Rutgers: HST/STIS, Pipeline	(27,000 lines)
Columbia, Dissertation	(60,000 lines)
Groningen: IRAS/LRS, Pipeline	(10,000 lines)

Code Written:

IDL:	(471,000 lines)
SuperMongo:	(163,000 lines)
FOR/SHEL-TRAN:	(64,000 lines)
PASCAL & C:	(1,000s lines)
SUM of ALL:	(700,000 lines)

Since I have been at the University of Maryland, I worked on (mostly in preparation of grant proposals or published and “in-preparation” papers): 1) GALEX data analysis (imaging & catalog), 2) HST/ACS/WFPCII, Kepler & GALEX image analysis, star/galaxy counts, extra-galactic proper motions (M31 & Omega Centaurus), 3) extra-solar planets: LEAVITT survey for 10,000 transiting planets (EXOP-TF white paper), 4) finding long-period extra-solar planets (solar system analogs) with SIM & HIPPARCOS (EXOP-TF white paper), 5) Effects of improved H_0 on equation of state of dark energy, 6) combined 2MASS JHK & B_T and V_T Tycho-2 photometric catalogs, 7) extracting the $b = \pm 20$ deg strip from the 2MASS catalog and importing the results

into IDL save-files, 8) find short-period binary systems in the HIPPARCOS & TYCHO-2 catalogs, 9) find new common-proper motion pairs in the HIPPARCOS & TYCHO-2 catalogs, 10) effects of non-steady state galactic dynamics on the “observables,” 11) to analyze the azimuthal dependence of the thickness of the Galactic HI layer, 12) et cetera.

During my 5 years at USRA/USNO, I wrote over 200,000 lines of IDL code to, among others: 1) Access the USNO-A2 star catalog, 2) Simulate FAME’s observing pattern, 3) Determine the star transit rate, 4) Determine the frequency of eclipses and occultations and their effects on the FAME mission, 5) estimate the confusion probability, 6) Develop a method to determine the 5 most important astrophysical quantities from FAME photometry, 7) Determine the astrometric and photometric precision that FAME can achieve, as a function of apparent magnitude and spectral type, 8) Derive a photometric parallax from 6-band FAME photometry, 9) Develop and implement a set of “centroiding” routines for the FAME data reduction pipeline, 10) Investigate the utility of Gauss-Hermite based centroiding algorithms, 11) a 25,000 line package to reduce dFTS data, 12) a 48,000 line package (100 routines) to analyze the HIPPARCOS and TYCHO-2 catalogs, 13) 7,000 lines to analyze Galactic HI and Cepheid data, 13) 14,000 lines to analyze various aspects of the SIM and TPF/C mission.

While at Rutgers University (NJ), I completed a data analysis package ($\gtrsim 27,000$ lines) for the HST long-slit spectrograph. This package is superior to the standard routines in that we designed it specifically to handle both the under-sampling of the spatial PSF and the presence of numerous cosmic rays.

While a postdoc at the University of Southampton (UK), I wrote a large amount of new software ($\gtrsim 73,000$ lines) in SuperMongo to perform new analyses of existing kinematic data of the Milky Way.

My dissertation work at Columbia University (NY) required a large amount ($\gtrsim 60,000$ lines) of new software to: 1) analyze high-resolution HI spectral line data, and 2) to determine the 2D potentials for model galaxies, so that their properties can be compared with the observations.

While at Columbia University, I was, in effect, the assistant to the system manager. There, I learned the basic skills to run networks of UNIX systems. I was responsible for installing and maintaining several software packages (e.g., AIPS, GIPSY and SM). I wrote a “security script” which checks whether CPUs are “alive”. This program proved effective enough to satisfy the insurance company’s requirements for security against theft. I was also part of the committee which plans the future development of computational resources in the department. In many aspects I served as a front-end to relieve our part-time system manager from the many small problems the computer users frequently faced. At my current institution, I am again responsible for maintaining the AIPS, GIPSY and SM packages on a system of tens of Unix boxes and PCs. In my previous position at the University of Southampton, I continued being responsible for general astronomy software packages: AIPS, GIPSY, and SM.

After receiving my undergradutae degree, I worked for four years as a Scientific Consultant for the Space Research Organization of the Netherlands. During this period, I ported an IRAS-specific image-processing system (GEISHA) from UNIX to VMS. I maintained and developed

CYBER/CCL scripts to sort the IRAS-LRS scans from a time-ordered to a sky-ordered database (totaling 42 6250bpi tapes). Using the GEISHA software, I developed new programs to extract “IRAS Low Resolution Spectra” from the data base, and implemented a system for extracting spectra from extended and/or low SNR sources not found in the LRS catalog. All software I wrote during this period was subject to the rigorous coding and documentation rules of the GEISHA system.

My computing experience started as an undergraduate student at the University of Groningen (NL). I actively participated in maintaining several programs of the “Groningen Image Processing System.” The final exam of the “Digital Image Processing” course consisted of designing an image processing system from scratch. We wrote documentation for essential programs, created a data structure and the user interface. The goals of this project were: 1) to emphasize the importance of the choice of the data structure, 2) to stress that the long-term maintainability and success of a code is determined by the degree to which it is documented, and 3) to show the importance of using the ANSII programming-language standards as much as possible. During this period, I also learned how to write code that is optimized for parallel and/or vector machines.

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Some of my publications can be obtained electronically at:

<http://www.astro.umd.edu/~olling/RecentPapers.html>

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