

## **Patricia Ann Whitelock**

Citizenship: Dual: United Kingdom/South Africa (SA since 1992)

SA ID No.: 5102220160088

**Education:** BSc (Hons class I) 1972, University College, London University  
DIC 1976, Imperial College of Science and Technology, London  
PhD 1976, Imperial College of Science and Technology, London

**Employment:** 1975 – 1977: Research Assistant, University College London  
1978 – 1997: Astronomer, South African Astronomical Observatory  
1989 – 1990: Astronomer, Anglo-Australian Obs., Sydney Australia  
1997 – 1998: Head of Division: Science Awareness and Education, SAAO  
1998 – 2002: Deputy Director, SAAO  
2002 – 2003: (18 months); Acting Director, SAAO  
2003 - 2011: Head of Division: Astronomy, SAAO,  
2011 - 2012: Director SAAO  
2013 – 2016 Astronomer SAAO  
2016 – 2021 Consultant Astronomer SAAO  
  
2006-2008: Visiting Professor UCT Mathematics & Applied Maths Dept.  
2009-2012: Visiting Professor UCT Astronomy Dept.  
2013-2016: Adjunct Professor UCT Astronomy Dept.

**Honours/Awards:** Fellow Royal Society of South Africa, 2000  
Member of the Academy of Sciences of South Africa, 2001  
Foreign Associate of the Royal Astronomical Society (UK), 2004  
(now called Honorary Fellow)  
Honorary Member of the SA Institute of Physics, 2008  
Honorary Professor UCT 2017-2021  
De Beers Gold Medal of the South African Institute of Physics, 2018  
Fellow of the SA Institute of Physics, 2018  
Doctor of Laws (HC) Rhodes University 2020

## **Membership of International Boards, Councils and Executive Committees**

- SA Liaison with the Large Scale Synoptic Telescope (LSST) Project, 2012- 2015
- Steering Committee of the IAU Office of Astronomy for Development, SA, 2010-2015
- Steering Committee of the Southern African Regional Office of Astronomy for Development, Zambia, 2015-2020
- Scientific Council for the Strasbourg Astronomical Data Centre (CDS), France, 2011-2019
  - Chair of CDS Council 2016-2018
- Executive Committee of the International Virtual Observatory Alliance, 2012-
- Royal Astronomical Society (UK) International Committee 2014-2018

## **Membership of Professional Organizations and Societies**

Astronomical Society of the Pacific, member 1979 - 2005

International Astronomical Union, member 1982 - present

Member of old commissions 27, 33, 34, 46, 55

Member organising committee com 27 (Variable Stars) 1997 - 2003

Member organising committee com 33 (Galactic Structure) 1997 - 2009

Member organizing committee com 55 (Communicating Astronomy with the Public) 2006-2012

Vice-President com 33 (Galactic Structure) 2000 – 2003

President Com 33 (Galactic Structure) 2003 - 2006

Member Special Nominating Committee 1997 – 2000 and 2009 – 2012

(This committee of 7 nominates the President and new members of the IAU executive)

National Representative com 46 (Education) 1997 - 2000

President Division VII (Galactic System) 2003 – 2006

Executive Committee WG on Future Large Scale Facilities 1997 – 2006

Executive Committee WG on Women in Astronomy 2003 – 2006; 2015 - 2018

Executive Committee WG on Global Coordination of Ground and Space Astrophysics 2016-2021

Member of Divisions B, C, D, G, H Commissions B3, C1, H1

International Union of Pure and Applied Physics:

Member of C19, Astrophysics, 2002 - 2005

Secretary of C19, Astrophysics, 2005 -2008

Royal Astronomical Society, junior member 1970 - 1975

Fellow 1975 - present

Royal Society of South Africa, member 1985 - 2000

Council 1996 - 2000

Vice-President 2002

South African Institute of Physics, member 1985 - present

Editor Newsletter 1997 – 2001 (I started the newsletter)

Chair Astrophysics Group 1990 - 1997

Council 1997 - 2005

Vice-President 1999 - 2001

President 2001 - 2003

Medals Committee 2006 – 2017, 2020

SA Women in Science and Engineering (SA WISE), member 1995 - present

Institute of Physics (UK), Fellow 2001 - 2018

### Visiting Fellowships

- Institut D'Astrophysique, Paris France, 1994
- Leiden Observatory, Netherlands, 1995
- European Southern Observatory, Garching Germany, 1997
- N. Copernicus Astronomical Centre, Poland, 2004 and 2005

**Research Interests:** Stellar evolution, Galactic structure and the stellar content of Local Group galaxies

**Other interests:** Strategy and International Collaboration, Science Education and Communication, Astronomy for Development

### Summary of Publications (as of December 2020):

209 papers in refereed journals (primary/sole author of 55)

115 papers in conference proceedings, book chapters etc

3 conference proceedings co-edited

**NRF Research Ratings:** B2 (1996), B1 (2002, 2008), A2 (2015)

**H-index:** 57 (Smithsonian/NASA Astrophysics Data system) December 2020

ORCID ID: <https://orcid.org/0000-0002-4678-4432>

ORCID provides a publically accessible list of my publications

Journals refereed: Papers regularly reviewed for:

Astronomical Journal (USA)  
Astrophysical Journal (USA)  
Astronomy & Astrophysics (Europe)  
Astronomy & Astrophysics Letters (Europe)  
Monthly Notices of the Royal Astronomical Society (UK)  
Publications of the Astronomical Society of the Pacific (USA)  
Publications of the Astronomical Society of Japan (Japan)  
Research in Astronomy & Astrophysics (China)

Telescope time/grant applications reviewed for:

AAT (Australia), Subaru (Japan), FONDECYT (Chile), Astrosat (India),  
National Science Centre (Poland), NRF (SA), European Research Council  
National Science Foundation (Switzerland)  
Research Foundation Flanders' (Europe)

Editorial Boards: Editorial Advisory Board SA Journal of Science, 1999 - 2001  
International Astronomical Union Editorial Board, 2004 – 2006  
SAJS Associate Editor: Physics, Mathematics & Astronomy, 2018

**Invited Lectures:** (with published proceedings)

- ❖ Workshop, Calgary Canada, 1986, “Late Stages of Stellar Evolution:” *Mira Variables and the Galactic Bulge Population*, with M.W. Feast
- ❖ IAU Colloquium 103, Torun Poland, 1987, “The Symbiotic Phenomenon:” *Infrared Observations of Symbiotic Miras*
- ❖ 10th Santa Cruz Workshop, Santa Cruz USA, 1989, “Supernovae:” *SN 1987A Light Curves*, with R.M. Catchpole & M.W. Feast
- ❖ 10th Pulsation Meeting, Bologna Italy 1990, “Confrontation between Stellar Pulsation and Evolution:” *Pulsating Red Variables*
- ❖ IAU Symposium 153, Ghent Belgium 1992, “Galactic Bulges:” *Long-Period Variables and Carbon Stars*
- ❖ IAU Symposium 155, Innsbruck Austria 1992, “Planetary Nebulae:” *Planetary Nebulae from Miras?* with M.W. Feast

- ❖ ESO/MPA Workshop, Garching Germany 1995, “Spiral Galaxies in the Near-Infrared:” *The Brightest Stars in the Galactic Bulge*
- ❖ IAU Colloquium 155, Cape Town 1995, “Astrophysical Applications of Stellar Pulsation:” *Pulsating Cool Stars and Galactic Structure*
- ❖ 12th IAP Conference Paris France 1996, “Variable Stars and the astrophysical Return of Microlensing Surveys:” *Variables and the Magellanic Clouds*
- ❖ IAU Symposium 177 Antalya Turkey, 1996, “The Carbon Star Phenomenon:” *Infrared Light Curves of Carbon-Rich Variables*
- ❖ IAU XXIII General Assembly, Kyoto Japan, 1997, Joint Discussion 8 “Stellar Evolution in Real Time:” *Real Time Evolution in Mira Variables*
- ❖ IAU XXIII General Assembly, Kyoto Japan, 1997, Joint Discussion 24 “Pulsating Stars - Recent Developments:” *IR Observations of Large Amplitude Pulsating Stars*
- ❖  $\eta$  Carinae Workshop, Montana USA, 1998, *Infrared variability of  $\eta$  Carinae*
- ❖ Monteporzio Catone Italy, 1999, “The Changes in Abundances in AGB Stars:” *Dust Enshrouded AGB Variables in the LMC*
- ❖ Odessa Ukraine, 2001, “Variable star conference:” *AGB Variables*
- ❖ Sendai Japan, 2002, Workshop “Mass-losing pulsating stars & their circumstellar matter:” *Luminosities of AGB Variables*
- ❖ Euroconference, La Palma Spain, 2002, on “Symbiotic stars probing stellar evolution:” *A comparison of symbiotic and normal Miras*
- ❖ Grand Teton National Park USA, 2004, “The Most Massive Stars:”  *$\eta$  Carinae in the infrared*
- ❖ Toron Poland, 2004, “Stellar astrophysics with the World’s Largest Telescopes” *Large Telescopes and Asymptotic Giant Branch Stars*
- ❖ Boston, USA, 2007, Meeting of the USA National Society of Black Physicists, “*Astrophysics in Southern Africa*”
- ❖ Tokyo Japan, 2008, “AGB Stars and Related Phenomena, A Conference in Honor of Yoshikazu Nakada”, *The Period Luminosity Relation in Mira Variables*
- ❖ Paris France, 2009, “The role of Astronomy in Society and Culture” *Astronomy in Post-Apartheid South Africa*
- ❖ Zvenigorod Russia, 2009, “Variable Stars, the Galactic halo and Galaxy Formation” *AGB Variables in the Galaxy and Local Group*”
- ❖ Rio de Janeiro Brazil, 2009, “Accelerating the Rate of Astronomical Discovery Special Session of IAU General Assembly”, *Astronomy and Development in Southern Africa*

- ❖ Naples Italy, 2011, “The Fundamental Cosmic Distance Scale: State of the Art and the Gaia Perspective”, *Asymptotic Giant Branch variables in the Galaxy and the Local Group*
- ❖ Beijing China, 2012, “Advancing the Physics of Cosmic Distances”, *Asymptotic Giant Branch Variables as Extragalactic Distance Indicators*
- ❖ Lijiang China, 2013, “IAUS 298 Setting the scene for Gaia and LAMOST”, *Variable Stars and Galactic Structure*. Coauthored with MW Feast.
- ❖ Barcelona, Spain 2014, “The Milky Way Unraveled by Gaia”, *Gaia, Variable Stars and the Distance Scale*, Coauthored with MW Feast
- ❖ Beijing, China 2017, “Stellar Populations and the Distance Scale (a conference in honour of Jeremy Mould), *AGB Variables in Local Group Dwarf Irregular Galaxies*
- ❖ Vienna, Austria 2018, IAUS 343: “Why Galaxies Care about AGB Stars: A Continuing Challenge Through Cosmic Time,” *Asymptotic Giant Branch Stars in Nearby Galaxies*

Plus numerous oral lectures and posters given at various symposia and colloquia around the world

**Invited Lectures:** (without published proceedings – only systematically recorded since 2003)

Schonland Lecture, Grahamstown SA 2000:

*A Remarkable Galaxy: Our home the Milky Way*

Leiden Netherlands 2003: Workshop on “AGB stars” in honour of Harm Habing:

*AGB Stars in the Milky Way*

Sydney Australia 2003: IAU General Assembly, Working Group on Future Large Scale Facilities:

*Southern African Large Telescope*, prepared jointly with David Buckley

Sydney Australia 2003: IAU General Assembly, Meeting of Commission 27:

*New Results on AGB Variables*

Stellenbosch SA 2003: 100<sup>th</sup> year Anniversary of the Physics Department of Stellenbosch University:

*Astronomy in South Africa*

Muizenberg SA 2003: Launch of the African Institute of Mathematical Studies (AIMS):

*A Bright Future for Astronomy in Southern Africa*

Bellville SA 2004: 48<sup>th</sup> Tygerberg Academic Year Day, Plenary Lecture:

*Astronomy in South Africa – A voyage to the edge of the universe and the beginning of time*

Polokwane SA, University of Limpopo, 2005: Opening talk for Science Week:

*Astronomy in South Africa*

Maropeng SA, 2012: The re-emergence of astronomy in Africa – a transdisciplinary interface of knowledge systems (sic):

*Why Astronomy?*

IUCAA India, 2013 at workshop on Transients and Timing:

*Studies of AGB Variables*

Cornell University, USA, 2013 at workshop: Planning the Future: Evolved Stars, Mass Loss, and Dust Production:

*AGB Variability in the Local Group*

Baltimore USA, 2014, workshop on “the Cosmic Distance Scale”

<http://www.stsci.edu/institute/conference/cosmic-distance>.

*Mira variables and the distance scale*

Munich, Germany, MIAPP 2018 meeting on Extragalactic Distances:

*Mira Variables as Distance Indicators*

<https://drive.google.com/drive/folders/1fGjhPKhqBaMdLs8Gj9kpcOobAmziSJMr>

Polokwane, South Africa, 2019, South African Institute of Physics: Gold Medal Plenary

*Wonderful Stars*

Santa Barbara, USA, 2019, KITP Conference: Tensions between the Early and the Late Universe

*Miras*

<https://online.kitp.ucsb.edu/online/enervac-c19/whitelock/>

Cape Town, South Africa, 2020, Symposium; Beyond 200 Years of Astronomy

*The National Astrophysics and Space Science Programme (NASSP)*

**Member of Scientific Organising Committees for International Meetings:**

- *Variable Stars and Galaxies*, Cape Town 1992
- *Astrophysical Applications of Stellar Pulsation*, IAU Coll 155, Cape Town 1995, Co-editor of Proceedings.
- *Astronomy in Science Education*, co-chairperson, Cape Town 1995
- *Asymptotic Giant Branch Stars*, IAU Sym 191, Montpellier France 1998
- *Stellar Content of Local Group Galaxies*, IAU Sym 192, Cape Town 1998, also chair LOC and co-editor of Proceedings
- $\eta$  Carinae, Workshop, Montana USA 1998
- *Eta Carinae and Other Mysterious Stars*, Hven Sweden 2000
- *Radial and nonradial pulsations as probes of stellar physics*, Leuven Belgium 2001
- *Variable Stars 2001*, Odessa, Ukraine, 2001
- *Exotic Stars as Challenges to Evolution*, IAU Colloquium 187, Florida, USA 2002
- *Mass losing pulsating stars and their circumstellar matter*, Sendai Japan, 2002
- *Symbiotic stars probing stellar evolution*, La Palma, Spain, 2002

- *Variable stars in the Local Group*, IAU Colloquium 193, Christchurch, New Zealand, 2003
- *Science with SALT II*, Cape Town, South Africa, 2003
- *Stellar Astrophysics with the World's Largest Telescopes*, Research Workshop, Torun, Poland, 2004
- *Science Requirements for Extremely Large Telescopes*, Cape Town, South Africa, 2005, Co-editor of Proceedings.
- *Science with SALT*, NASSP/AIMS Student workshop, 2005 (Chair of OC)
- *V838 Monocerotis*, Research workshop, La Palma, Spain, 2006
- *Future Large Scale Facilities* (Special Session), *Exploiting Large Scale Surveys for Astronomy* (Joint Discussion) and *New Results on the Galactic Centre* (Division VII Science Meeting), at IAU General Assembly, Prague, Czech Republic, 2006
- *Communicating Astronomy with the Public 2007 (CAP 2007)*, Athens, Greece, 2007
- *The role of Astronomy in Society and Culture*, IAU Symposium 260, Paris, France, 2009
- *Variable Stars, the Galactic halo and Galaxy Formation*, Zvenigorod, Russia, 2009
- *Communicating Astronomy with the Public 2010 (CAP 2010)*, Cape Town, SA, 2010
- *2<sup>nd</sup> Middle East and African Regional IAU Meeting (MEARIM2)*, Cape Town, SA, 2011
- *New Horizons in Time Domain Astronomy*, IAU Symposium 285, Oxford, UK, 2011
- *IAU Strategic Plan and the Global Office of Astronomy for Development*, Special Session of IAU GA, Beijing China, 2012
- *Communicating Astronomy with the Public for Scientists*, Special Session of IAU GA, Beijing China, 2012
- *Setting the Scene for Gaia and LAMOST*, Lijiang China, 2013, also co-editor of Proceedings.
- *Why Galaxies care about AGB stars III*, Vienna Austria, 2014
- IAU GA FM11: *Global Coordination of Ground and Space Astrophysics and Heliophysics* FM20: *Astronomy for Development*, Honolulu USA, August 2015
- *IVOA Interoperability Meeting*, Stellenbosch SA, May 2016, also chair of LOC
- *CS19: Cool Stars, Stellar Systems and the Sun*, Uppsala Sweden, June 2016, also co-chair of splinter session on AGB stars and supergiants
- *Wide-Field Variability Surveys: A 21<sup>st</sup> Century Perspective*; 22<sup>nd</sup> Los Alamos Stellar Pulsation Conference, San Pedro de Atacama, Chile November 2016
- *SN 1987A, 30 Years Later*, IAU Symposium 331, La Réunion Island, February 2017
- *AGB-Supernovae Mass Transition*, Rome, Italy, March 2017
- *Astrometry and Astrophysics in the Gaia sky*, IAU Symposium 330, Nice, France, April 2017
- *Rediscovering our Galaxy*, IAU Symposium 334, Potsdam, Germany, July 2017
- *FM13 (IAU GA) Global Coordination of International Astrophysics and Heliophysics Activities from Space and Ground*, Vienna, Austria, August 2018
- *IAU Symposium 347 Early Science with Extremely Large Telescopes*, Vienna, Austria, August 2018



- *Kavli-IAU workshop: International co-ordination of multi-messenger transient observations in the 2020s and beyond*, SAAO Cape Town, February 2020 co-chair SOC, chair LOC

### **Member of Organizing Committee for South African Meetings**

- NASSP/AIMS workshop on *Science with SALT*, 2005 (chair of OC)
- Chris Engelbrecht Summer School in theoretical physics: *The Dark Side of the Universe*, 2006
- 2006 Annual Conference of the South African Institute of Physics (UWC)
- 2007 SALT Science and AstroGrid workshop (UKZN)
- 2012 LOC for IAU Sym 287 on Cosmic Masers: from OH to H<sub>0</sub>
- 2016 Co-chair SOC IRSF: Past and Future (SA-Japan binational)
- 2020 SAAO Symposium: Beyond 200 Years of Astronomy

### **Membership of other South African Committees, Boards, Trusts etc.**

- ❖ National Research Foundation Executive, 1998 - 2003
- ❖ SA National Committee for Astronomy, 1998 – 2012
  - ❖ Chair 2007-2012
- ❖ National Astrophysics and Space Science (NASSP) Steering Committee, 2001-2015
  - ❖ Chair: 2001- 2013
- ❖ SA National Committee for Pure and Applied Physics, 2002 - 2005
- ❖ Advisory Board for the African Institute of Mathematical Sciences (AIMS), 2003 - 2010
- ❖ NRF committee to establish the “Astronomy Frontiers Programme”, 2005 - 2006
- ❖ DST Committee for “Astronomy Geographic Advantages Programme” 2006 – 2007
- ❖ Assorted NRF Committees, e.g. SANAP (2005), Research Chairs (2007), SKA chairs (2009), Multiwavelength Astronomy (2010)
- ❖ Trustee for the Nigel and Judy Weiss Education Trust from 2011
- ❖ Board of the National Institute of Theoretical Physics (NITheP) 2012-2015
- ❖ Steering Committee for SA Astroinformatics Association (SA<sup>3</sup>) from 2013
- ❖ South African LSST Committee, 2015-2019
  - Chair: 2015-2017
- ❖ Standing Astronomy Grants Panel 2015-2017
- ❖ ASSAf panel for consensus study on *Collaborative Research in South Africa* 2016-2019

### **Graduated Research Students:**

- Lerothodi Leeuw 1995/96 jointly supervised with Michael Feast (UCT) for his MSc, awarded June 1997 from the University of Cape Town
- Enrico Olivier 1998/99 jointly supervised with Robbie Linsey (UWC), MSc (with distinction) awarded March 2000 from the University of Western Cape
- Ronald Heijmans 1999/2000 jointly supervised with Harm Habing (Leiden Univ. Netherlands) for doctoraal project (MSc equivalent), 2001
- Francois Nsengiyumva 2009/10 jointly supervised with Michael Feast (UCT) and John Menzies (SAAO) for his MSc, awarded 2011, University of Cape Town
- Oyirwoth Abedigamba 2009/10 jointly supervised with Michael Feast (UCT) for his MSc, awarded 2011, University of Cape Town
- Elias Aydi 2016/2018, Jointly supervised for his PhD with Shazrene Mohamed, Multi-wavelength Studies of Classical Novae, Graduated in 2018 from the University of Cape Town

### **PhD thesis examined:**

- ❖ 1996 Raylee Anne Stathakis, Spectroscopy of SN 1987A, University of Sydney, Australia
- ❖ 2001 Maria-Rosa L. Cioni, AGB stars & other red giants in the Magellanic Clouds, Leiden University, Netherlands
- ❖ 2003 Daniel John Pooley, Spectroscopic and Photometric Monitoring of Southern Post AGB Stars, University of Canterbury, New Zealand
- ❖ 2014 Sara Bladh *Opponent* University of Uppsala, Sweden, defence: Dynamical Atmospheres and Dust-driven winds of M-type AGB stars
- ❖ 2017 Michele Trabucchi University of Padova, Italy. (reviewer)

**Biography:** in *Enquiring Minds* by Albie van de Venter, Briza Publications, Pretoria, 1999

### **Contact Details**

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