Brief CV of Professor Peter G. Martin, OC, FRSC, FRCGS, PhD

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Research Interests
Interstellar Medium, Polarization, Gas and Dust, Structure Formation, Star Formation

Perspective
Professionally I have worked to put in place "crucibles of creativity," whether workshops, scientific meetings, summer schools, national long-range plans, international research collaborations, or entire new institutes such as CITA and the Dunlap Institute, so that the players in the field are not only nurtured and sustained but also enabled to advance through individual and collaborative effort and insight toward greater understanding. That is more or less what has driven me, and still does, and I am as surprised and delighted as anyone in how it often works out better than could have been foreseen!

Professional Preparation
1972 Ph.D., Astrophysics, Department of Applied Mathematics and Theoretical Physics, University of Cambridge
1969 M.Sc., Astrophysics, Department of Astronomy and Astrophysics, University of Toronto
1968 B.Sc., Mathematics and Physics, University of Toronto

Professional Appointments at University of Toronto
Professor, Canadian Institute for Theoretical Astrophysics (CITA)
Senior Fellow, Massey College
Timeline
Appointed Assistant Professor, 1972; tenure awarded, Associate Professor, 1976; Professor, 1980.
Chair, Astronomy and Astrophysics, 1999–2010; Director, David Dunlap Observatory (DDO), 1999–2008.
Acting Vice-Dean Research and Graduate Education, Faculty of Arts and Science, 2011.
Founder
CITA: First faculty member of CITA, 1984; Acting Director 1984–85; Interim director 2024.
Dunlap Institute: Interim/Acting Director, Dunlap Institute for Astronomy and Astrophysics, 2008–10, 2012-14.

Visiting Appointments
University of Arizona and University of Cambridge, 1978–79. UCSC, 1986–87. Caltech, 1992-93, 2001–02.
University of Paris XI, 2002, 2007, 2017. École normale supérieure Paris, 2018.

Honours and Awards
2020 Fellow, Royal Canadian Geographical Society
2019 Giuseppe and Vanna Cocconi Prize, Planck Collaboration, European Physical Society
2018 Gruber Cosmology Prize, Planck Team, Gruber Foundation
2017 Publications Research Award for Research in Art, Mystical Landscapes co-authors (book for the exhibition jointly presented at the Art Gallery of Ontario and the Musée d'Orsay, Paris), Canadian Museums Association
2018 Group Achievement Award, Planck Team, Royal Astronomical Society
2016 Officer of the Order of Canada
2014 Executive Award for Outstanding Service, Canadian Astronomical Society
2014 Group Achievement Award, Herschel-SPIRE Consortium, Royal Astronomical Society
2013 Queen Elizabeth II Diamond Jubilee Medal, through the Royal Society of Canada
2007 Fellow, Royal Society of Canada
2006-08 President, Canadian Astronomical Society (Vice President 2004-06, Past President 2008-2010)
1994 C.S. Beals Award (outstanding achievement in research), Canadian Astronomical Society
1969-72 Commonwealth Scholar at University of Cambridge
1968 Gold Medal of the Royal Astronomical Society of Canada

Collaborative Team Building
JWST: Science team for NIRCam GTO, Interstellar Medium and star formation
Planck: Editorial Board; Co-coordinator of Working Group 7 on Galactic and Solar System Science (128 member team); HFI

Core Team: Interstellar Dust, Submillimeter Polarization, and Magnetic Fields.
Herschel: SPIRE Collaboration on the Herschel Space Observatory: Key Projects on Star Formation and on evolution of Dust. Science Steering Committee of the Herschel Galactic Plane Survey (Hi-GAL)
BLAST05, BLAST06, BLASTPol: Science Team – Star Formation, Interstellar Medium, Supernova Remnants, Magnetic Fields.
Canadian Galactic Plane Survey (CGPS): Co-lead, focused on H I survey
GHIGLS: PI of precision surveys of H I at intermediate Galactic latitude with the Green Bank Telescope
DHIGLS: PI of high resolution H I surveys in the DRAO Planck Deep Fields

Capacity Building: Vignettes

CIFAR. During the development of the case for federal funding for CITA, I was canvassing diverse opportunities to advance theory. I had the privilege of many breakfast discussions with Fraser Mustard who was championing his own novel new organization, the Canadian Institute for Advanced Research. I would have liked to have CIFAR support all of theoretical astrophysics, but a more focused program on cosmology caught their imagination (and a donor's!). A few months after the founding of CITA, I eagerly embraced this and with Bill Unruh (UBC) and Georges Michaud (UdeMontreal) wrote a proposal that formed the basis for the CIFAR Cosmology program. That program was enormously beneficial to the early expansion of faculty in CITA (Dick Bond, Nick Kaiser). CIFAR programs were supposed to last for five years, but we worked with CIFAR for four decades in mutually reinforcing ways.

Computing clusters. My involvement started with leading in the VAX collaboration, breaking away for institutional mainframes, through adopting UNIX to my own first cluster and then CITA's McKenzie (39th in the world on benchmarks). We collaborated with physical sciences at UofT on PsiNET, which expanded into SciNET in the trans-Canada suite of HPC computers operated by the Digital Research Alliance. SciNet still operates the largest cpu and gpu cluster (Trillium) and has been enormously important to theoretical astrophysics simulations and now work with AI.

Instrumentation. The vision statement that I wrote for the Dunlap Institute emphasized the critical role that instrumentation plays in our field. Dunlap scientists have embraced this with enthusiasm, with leadership roles in major instruments like GIRMOS for Gemini and the CHIME and CHORD facilities. Another theme has been advancing remote observing starting with off-the-shelf telescopes, which can be scaled up (like compute clusters) into awesome arrays like Nick Law's Evryscopes and Argus Array and Bob Abraham's and Pieter van Dokkum's Dragonfly.

Polarization. During my thesis I became interested in interstellar birefringence and boldly proposed to Rogel Angel, whom I had met at a conference, that he might make some definitive observations. He countered that I could join forces with his graduate student Rainer Illing to use his polarimeter, leading to a successful collaboration. Early observations were painstaking In many dimensions, and so later when a new computer-controlled Angel polarimeter was developed I pitched in by writing the instrument control and data reduction software (in FORTH with a 3-pass paper tape assembler, so up front pain!). This in turn led to our building at DDO a next-generation first-light instrument for the CFHT. This depended on integration with the "French photometer head" that unfortunately was never delivered. Undeterred, I arranged for the polarimeter to be repurposed to become a workhorse at the Mont Megantic telescope.

The Dominion Radio Astrophysical Observatory (DRAO). In the early 1990s, the then Director General of the Herzberg Institute of Astrophysics, Don Morton, was consolidating all NRC activities (ARO/Ottawa, DRAO/Penticton) at DAO/Victoria. I had become interested in science enabled by IRAS and H I observations from the DRAO synthesis telescope, and Morton agreed if we university astronomers could get major NSERC funding to support this science, then he would keep the site open. We were successful and carried out the Canadian Galactic Plance Survey (H I and continuum, with polarization) and later the DRAO Deep Fields in support of Planck science. Preservation of the DRAO radio quiet site has enabled the building of CHIME and the follow-on CHORD facilities, for FRB and cosmological science.

Outreach. It is significant that the DDO is still a historic site used for public programming (Richmond Hill with the RASC). While leading Dunlap, I enthusiastically backed the West African International Summer School for Young Astronomers (http://westafrica.astro4dev.org/waissya/) spearheaded by CITA postdoc Linda Strubbe. At the time, I advised the IAU on building an Office of Astronomy for Development, rather than an Office for the Development of Astronomy, and fortunately the first won out. Our school was very much in this spirit, though of course astronomy capacity did get developed too. WAISSYA has now grown into PASEA (https://www.paseaafrica.org) for which Linda has been so deservedly recognized. https://www.artsci.utoronto.ca/news/former-cita-postdoctoral-fellow-receives-2024-iau-astronomy-education-prize