CURRICULUM VITÆ

ANTHONY B. DAVIS

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EDUCATION

McGill University, PhD, Physics, 1992
Université de Montréal, MSc, Physique, 1980
Université Pierre et Marie Curie (Paris 6), Maîtrise en Physique, 1977

EMPLOYMENT

Research (Atmospheric Physics, Radiation, and Remote Sensing):

02/09 – present *Research Scientist*, Aerosol and Cloud Group (329J),
Jet Propulsion Laboratory, managed for NASA by the California Institute of Technology.

06/10 – 06/17 *Visiting Research Faculty*, Joint Institute for Regional Earth System Science and Engineering (JIFRESSE), University of California – Los Angeles

02/09 – 12/15 *Guest Scientist*, Space and Remote Sensing (ISR-2) & Space Data (ISR-3) Groups,
11/97 – 01/09 *Technical Staff Member*, Space and Remote Sensing Group (ISR-2),
Los Alamos National Laboratory, managed for the US DOE by:
University of California (1943-2006); Los Alamos National Security, LLC (06/2006 – present).

11/92 – 10/97 **NASA – Goddard Space Flight Center**
95-97, Climate and Radiation Branch: *Senior Scientist*, SSAI
92-94, Climate and Radiation Branch: *GSFC Visiting Scientist*, USRA

05/92 – 10/92 **Atmospheric Environment Service**
Postdoctoral Research Fellow, NSERC, Numerical Prediction Research Division

01/86 – 08/86 **Université de Sherbrooke**
Research Assistant, Centre d'Applications et de Recherches en TÉLédétection (CARTEL)

Teaching (Physics, Astronomy, and Astrophysics) and Outreach Activity:

09/84 – 04/86 **Concordia University**, Montreal (Qc, Canada), Physics Department, *Part-Time Lecturer*

01/82 – 12/83 **Collège de Sherbrooke**, Sherbrooke (Qc, Canada), Département de Physique, *Full-Time Prof.*

01/81 – 04/81 **Université de Sherbrooke**, Sherbrooke (Qc, Canada), Département de Physique, *Part-Time Prof.*

05/80 – 04/81 **Les Productions Régulus**, Longueuil (Qc, Canada), *Technical Writer*

07/78 – 10/85 **Dow Planetarium**, Montréal (Qc, Canada), *Lecturer, Script Writer*

PROGAMMING SKILLS

Fortran: advanced in coding, proficient in distributed execution on massively-parallel systems;
Mathematica: advanced in modeling (symbolic math) and graphics, proficient in data analysis and visualization;
Kaleidagraph: advanced plotting and spreadsheet programing;
MatLab: proficient in coding and graphics.

RESEARCH INTERESTS

- Remote sensing techniques, as applied to the Earth's cloudy atmosphere, in visible, near-IR and shortwave-IR spectral regions, emphasizing polarization diversity and differential oxygen absorption spectroscopy.
- Tomographic reconstruction of 3D clouds and aerosol plumes (outer shapes, internal structures and microphysical properties) using passive multi-spectral/multi-angle/multi-polarization imagery.
- Visibility, imaging, and atmospheric compensation in scattering planetary atmospheres, specifically, Titan (in support of terrain relative navigation) and Venus (in support of surface sensing from a below-cloud platform).
- Optical communication through scattering and absorbing media, namely, cloud edges and turbid ocean waters.
- Exoplanetary atmospheres: transmission spectroscopy in the presence of spatially variable cloudiness.
- Computational vector radiative transfer in 1D vertically variable atmospheres over anisotropic polarizing surfaces, and in spatially complex 3D scattering or reflecting media such as clouds, cloud/aerosol/surface systems, vegetation and rough terrain.
- Bayesian cloud and aerosol retrieval algorithms and information content analysis.
- Sensor-level observation system simulation experiments (OSSEs) and retrieval uncertainty quantification (UQ).
- New instrument concepts/synergies, e.g., using active modalities such as off-beam/multiple-scattering cloud lidar.
- Large- and small-scale radiation energetics for realistic 3D clouds and cloud/aerosol/surface systems.
- Climate impacts of clouds and aerosols via energy and water cycles.
- Multi-scale/multi-moment statistical analyses of nonlinear atmospheric processes using wavelet transforms, fractals and multifractals.

MEMBERSHIP

American Geophysical Union (since 1991)
American Meteorological Society (since 1998)

AWARDS & HONORS

NASA, Group Achievement Award (August 2017): AirMPSI 2015–2016 Campaign Team
NASA, Group Achievement Award (February 2015): Studies of Emissions and Atmospheric Composition, Clouds and Climate Coupling by Regional Surveys (SEAC4RS) campaign in 2013
Journal of Quantitative Spectroscopy and Radiative Transfer, Outstanding Reviewer (February 2014)
Kavli Institute for Theoretical Physics (KITP), University of California – Santa Barbara (UCSB):
Visiting Scholar, 4/18–5/6/2011, Research Program on "The Nature of Turbulence" (Feb-June, 2011)
Los Alamos National Laboratory (LANL), New Mexico:
Nomination to represent LANL at 2006 R&D100 Awards: Wide-Angle Imaging Lidar (WAIL)
Distinguished Performance Award (2005) – Small Team, Wide-Angle Imaging Lidar (WAIL)
Distinguished Performance Award (2001) – Large Team, Multispectral Thermal Imager (MTI)
Performance Award (1999) – Space and Remote Sensing Science Group
Université Blaise Pascal (Clermont-Ferrand, France):
Visiteur Scientifique Invité, Laboratoire de Météorologie Physique (LaMP) du CNRS (2002)
University of New South Wales (Sydney, Australia):
Gordon Godfrey Visiting Scholar, School of Physics (summer, 2001)
Optical Society of America:
Blue-Ribbon Prize Poster, Category Optics in Biology and Medicine (1998 Annual Meeting)
NASA – Goddard Space Flight Center:
Performance Award – Climate and Radiation Branch (1996)
Météorologie Nationale (France):
Collaborateur Scientifique, Centre de Recherche en Météorologie Dynamique (1991)
Scholarships:
Atmospheric Environment Service – Environment Canada (1989 – 1990)
Fonds FCAR – Gouvernement du Québec (1986 – 1989)

SERVICE

Reviewer (articles): Applied Optics, Atmospheric Measurement and Technology – Discussion (AMT-D), Atmospheric Science Letters, Earth & Space Sciences, Environmental Fluid Dynamics, Frontiers, Geophysical Review Letters, IEEE Transactions in Geoscience and Remote Sensing (TGRS), Journal of Applied Meteorology & Climatology, Journal of Atmospheric and Oceanic Technology, Journal of Climate, Journal of Computational Physics, Journal of Geophysical Research – D (Atmospheres), Journal of the Atmospheric Sciences, Journal of the Optical Society of America – A (Optics, Image Science, and Vision), Journal of Physics – A (Mathematical and Theoretical), Journal of Quantitative Spectroscopy and Radiative Transfer, Remote Sensing (MPDI), Remote Sensing of the Environment, Optical Science and Engineering, Physical Review E (Statistical, Nonlinear, and Soft Matter Physics), Physical Review Letters, Quarterly Journal of the Royal Meteorological Society, Remote Sensing, Science Reports, Water Resources Research, and a few others.

Reviewer (proposals): NASA ROSES (SMD/ESD, ESTO, Postdoctoral, and Graduate Fellowship Program elements); DOE – Office of Science (ARM Program); NSF – Geosciences; LANL – Laboratory Directed Research and Development (LDRD) programs; FOM (The Netherlands); JPL internal reviews.

Editorship: co-editor, with Alexander Marshak (NASA – GSFC), of *3D Radiative Transfer in Cloudy Atmospheres* (Series in Physics of the Earth and Space Environments), xii+686 pp, Springer, Heidelberg (Germany), 2005; co-guest editor, with Richard Sanchez (CEA – Saclay), for *Journal of Quantitative Spectroscopy and Radiative Transfer* (Special Issue on the M&C 2009 ANS Topical Meeting), Vol. 112, 2011; Associate Editor for *Journal of Geophysical Research – Atmospheres (JGR–D)*, 2016–present; Associate Editor for *Frontiers in Remote Sensing*, 2023-present.

Committee or working-/focus-group member: AGU *Focus Group on Nonlinear Geophysics* (founding member); AMS *Committee on Atmospheric Lidar Studies (CLAS)*; Executive Committee, *Intercomparison of 3D Radiation Codes (I3RC)*; DOE Atmospheric Radiation Measurement (ARM) Program: *Radiative Processes (RP)* and *Cloud Properties (CP)* Working Groups; International Space Science Institute (ISSI) workshop series on *Aerosol Remote Sensing from Space*.

Convener: Many special/topical sessions at *American Geophysical Union* Fall and Spring/Joint Meetings in Union (U), Atmospheric Science (AS) sections, and Nonlinear Geophysics (NG) focus group, at *DOE/ARM Science Team Meetings*, at *I3RC International Workshops*, and *American Nuclear Society's Mathematics & Computation 2009 Conference*; Technical Committee Member and Mini-Symposium Co-Chair for the International Conference on *Image Science 2012* sponsored by the Society for Industrial and Applied Mathematics (SIAM); Scientific & Elsevier Early-Career Award Committees at *Electromagnetic Light Scattering* conferences.

Mentor/co-mentor (undergraduates): Olivia M. Castellini (DePauw University), Jesse Venegas (California State University), Brahim Piqué (U. of Puerto Rico), Lernik Asserian (UCLA), and Kailen Hargenrader (Caltech).

Mentor/co-mentor (graduate students): Charles A. Rohde (Michigan Technological University), Nikola P. Petrov (U. of Texas), Heather M. Ward (U. of NM), Emad Iskander (San Jose State University), Guillaume Merlin (U. de Lille 1), and Aviad Levis (Technion – IIT).

Mentor/co-mentor (postdocs): Stéphane Roux (NRC-NASA Fellow), Karen L. Hirsch (LANL), Christopher A. Jeffery (LANL PRD Fellow), Karen E. Fisher (LANL), Igor N. Polonsky (LANL PRD Fellow), Feng Xu (NPP Fellow), Suniti Sanghavi (JPL/Caltech), and Linda Forster (Marie Skłodowska Curie Fellow).

Doctoral jury member: U. de Bordeaux, U. de Clermont-Ferrand, U. of New South Wales, Boston U., U. Lille – 1 / Laboratoire d'Optique Atmosphérique, U. Paris-Est / École Nationale des Ponts et Chaussées, U. Toulouse – 1 / Paul Sabatier.

Professional reference: Rutgers U., U. of Washington, UC-Berkeley, Heidelberg U., DLR, U. de Clermont-Ferrand, CNRS-LOA/U. de Lille 1, UMBC/JCET, UCSB/ICESS, NASA/GSFC, DOE/PNL, DOE/BNL, DOE/LANL, DOE/SNL, etc.

PUBLICATIONS & PRESENTATIONS

- 102 referred publications in archival journals (list available upon request)
- 56 articles and chapters in edited volumes, mostly peer-reviewed (list available upon request)
- 86 extended abstracts contributed to conference proceedings, some peer-reviewed (list available upon request)
- 22 preprints, technical reports, white papers, etc. (list available upon request)
- 16 outreach and tutorial publications: *Eos – AGU Transactions, Phys. Today, etc.* (list available upon request)
- Co-editor / co-author of *3D Radiative Transfer in Cloudy Atmospheres*, Springer, Heidelberg (Germany), 2005.
- 526 presentations at conferences, symposia, workshops, and other meetings (list available upon request)