

CURRICULUM VITAE

Robert W. Smith

PERSONAL INFORMATION

Address: Department of History and Classics
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MAJOR AWARDS AND HONORS

- 2016: University of Alberta Faculty of Arts Award for Research Excellence
- 2012: Sarton Lecturer, for History of Science Society at the American Association for the Advancement of Science
- 2011-12: Killam Annual Professor, University of Alberta
- 2007: Lindbergh Chair of Aerospace History, Smithsonian Institution, Washington D.C., U.S.A.
- 2005-6: McCalla Professor, University of Alberta
- 1996-7: Dibner Visiting Historian of Science for History of Science Society
- 1992-3: Walter Hines Page Fellow at the National Humanities Center, U.S.A.
- 1992: Plenary Address to the Winter Meeting of the American Astronomical Society on the History of the Hubble Space Telescope.
- 1990: Winner of the History of Science Society's Watson Davis Prize for *The Space Telescope: A Study of NASA, Science, Technology, and Politics* (the book was also listed as one of the notable books of the year for 1990 by the *New York Times Book Review* and selected by *Choice* as one of the outstanding academic books of 1990-91).
- 1989: Winner of Herbert C. Pollock Prize in the History of Astronomy

ACADEMIC POSITIONS HELD

1998-Present: Full Professor, Department of History and Classics, University of Alberta

2007-2010: Director, Science, Technology and Society Program, University of Alberta

1998-2003: Chair, Department of History and Classics, University of Alberta

1996-1998: Chair of the Department of Space History at the National Air and Space Museum, Smithsonian Institution, Washington DC.

1986-1998: Adjunct Professor in the Department of the History of Science, Technology, and Medicine, at The Johns Hopkins University.

1982-1996: Historian, Department of Space History, National Air and Space Museum, Smithsonian Institution, Washington DC.

1978-1982: Assistant Keeper, Department of Physical Sciences, National Galleries and Museums on Merseyside, England.

POST-SECONDARY EDUCATION

1979: Ph.D. in History and Philosophy of Science, University of Cambridge, England

1975: Part III of the Mathematics Tripos, University of Cambridge, England

1974: First Class Honours Degree in Physics from Queen Mary College, University of London, England

PUBLICATIONS

Books

1. *The Hubble Cosmos: 25 Years of New Vistas in Space* (National Geographic Society, 2014), coauthored with David DeVorkin. This edition has been translated into Chinese.
2. *Imaging Space and Time* (National Geographic Society, 2008), coauthored with David DeVorkin. Greatly expanded and revised edition of item #3. Revised Paperback Edition, 2011. The paperback edition has been translated into Italian and Japanese.
3. *The Hubble Space Telescope: Imaging the Universe* (National Geographic Society, 2004), coauthored with David DeVorkin.
4. *Reconsidering Sputnik: Forty Years Since the Soviet Satellite* (Harwood Academic Publishers, 2000) coeditor with R. Launius and J. Logsdon.
5. *The Space Telescope: A Study of NASA, Science, Technology, and Politics*, (Cambridge University Press, 1989), with contributions by Paul Hanle, Robert Kargon, and Joseph Tatarewicz. A paperback version of this book, with an additional 10,000 word chapter, was published in 1993.
6. *The Expanding Universe: Astronomy's 'Great Debate' 1900-1931*, (Cambridge University Press, 1982). A Spanish language edition was published by the Alianza Press in 1993. Paperback edition published in 2010.

Major Editorial Responsibilities for Scholarly Works

1. Coeditor (with Kathleen Lowrey) of special issue of *Victorian Review* on Alfred Russel Wallace, 41(2015), 49-191.
2. Associate Editor for Astronomy and Astrophysics, for *New Dictionary of Scientific Biography*, edited by N. Koretge, (Charles Scribner's and Sons, 2007), 8 volumes plus publication as eBook. Additional to 16 volumes of the *Dictionary of Scientific Biography* published in the 1970s. Responsible for 21 entries (approx. 80,000 words). Also wrote entry on J.H. Oort, 23(2008), 341-7.
3. Supervisory Editor for "Astronomy" for *Biographical Dictionary of British Scientists of the Nineteenth Century* (Thoemmes and University of Chicago Press, 2004), B. Lightman (general editor), 4 volumes. Total of 54 entries. Also wrote entries on "Thomas Brisbane," "E.W. Brown," and "William Donkin."

Papers, Book Chapters and Essay Reviews

1. "Mapping the Universe," for *Oxford Illustrated History of Science*. (Oxford: Oxford University Press, forthcoming 2017), (12760 words), edited by Iwan Morus.
2. "Alfred Russel Wallace, Extraterrestrials, Mars and the Nature of the Universe," *Victorian Review* , 41(2015), 151-176.
3. "Hubble's Law," in *Discoveries in Modern Science: Exploration, Invention, Technology* (Macmillan, 2015), edited by James Trefil, Volume 2, 511-521.
4. "A One Galaxy Universe, the Discovery of Galaxies and the Shift to Modern Approaches to the Cosmos," in *Lessons from the Local Group* (Springer, 2015), edited by Kenneth Freeman, Bruce Elmegreen, David Block, Matthew Woolway, 413-421.
5. "'The Great Plan of the Visible Universe': William Huggins, Evolutionary Naturalism and the Nature of the Nebulae," in *The Age of Scientific Naturalism* (Pickering and Chatto, 2014) edited by Michael Reidy and Bernard Lightman, pp. 113-136.
6. "The Road to Radial Velocities: V.M. Slipher and Mastery of the Spectrograph," in *Origins of the Expanding Universe: 1912-1932* (Astronomical Society of the Pacific, 2013), 143-164, edited by Michael J. Way and Deidre Hunter.
7. "A Gift of the Cold War," in *Earth-Bound to Satellite: Telescopes, Skills and Networks* (Brill, 2011), edited by A.D. Morrison_low, Sven Dupre, Stephen Johnston and Giorgio Strano, 235-249.
8. "Early history of space astronomy," in *400 Years of Astronomical Telescopes: A Review of History, Science and Technology*, edited by B. Brandl, R. Stuik, J. Katgert-Merkelijn, (Springer, 2009), 447-59.
9. "Beyond the Galaxy: The Development of Extragalactic Astronomy, 1885-1965, Part II," *Journal for the History of Astronomy*, 40(2009), 71-107.
10. (co-authored with Patrick McCray; Robert W. Smith lead author), "Beyond the Hubble Space Telescope: Early Development of the Next Generation Space Telescope," in *Astrophysics for the Next Decade* (Springer, 2009), edited by H.A. Thronson, A.G.G. Tielens, and M. Stiavelli, 31-50.

11. "Beyond the Galaxy: The Development of Extragalactic Astronomy, 1885-1965, Part I," *Journal for the History of Astronomy*, 39(2008), 91-119.
12. "Beyond the Big Galaxy: The Structure of the Stellar System 1900-1952," *Journal for the History of Astronomy*, 37(2006), 307-42.
13. "The History of Space Astronomy: Reflections on the Last Three Decades," in *The New Astronomy: Opening the Electromagnetic Window and Expanding Our View of Planet Earth* (Springer, 2005), 215-28, edited by Wayne Orchiston.
14. "La Scoperta di Nettuno e il problema del perielio di Mercurio (Discovery of Neptune and the Perihelion Advance of Mercury)," for *Storia della scienza* editor-in-chief Sandro Petruccioli, (Roma, 2003) Istituto della Enciclopedia Italiana, 10 v., 2001-4, v. VII, 2003, (Rome, 2003), 222-234.
15. "Who Discovered the Expanding Universe?" (coauthored with Helge Kragh) *History of Science*, 41(2003), 141-162.
16. "The Remaking of Astronomy" in the *Cambridge History of Science. Vol. 5. Modern Physical and Mathematical Sciences*, edited by Mary Jo Nye, (Cambridge University Press, 2003), 154-173.
17. "Einstein's Tower," *Studies in History & Philosophy of Modern Physics*, 33(2002), 591-9, (Essay Review)
18. "Introduction," *Historical Studies in the Physical and Biological Sciences*, 32(2002), 3-9. (introduction to special issue of journal on history of laboratories).
19. "From Hubble to Hubble," in *Beyond Earth: Mapping the Universe* (National Geographic, 2002), edited by D. DeVorkin, 120-137.
20. Entries on "Galactic Astronomy c 1900-1950" and "Extragalactic Astronomy c 1900-1950," (both 5,000 words) in *Encyclopedia of Astronomy and Astrophysics* (Institute of Physics Publishing and Macmillan Ltd.,2001), 4 vols., P. Murdin (general editor), vol. 1, 773-8 and 819-24.
21. "Kapteyn and Cosmology," in *The Legacy of J.C. Kapteyn*, (Kluwer Academic Publishers, 2000), edited by P.C. van der Kruit and K. van Berkel, 175-190.
22. "A Setting for the International Geophysical Year," in *Reconsidering Sputnik: Forty Years Since the Soviet Satellite* (Harwood, 2000), edited by R. Launius, J. Logsdon, and R. Smith, 119-124.
23. "Les premiers grands telescopes," *Les Cahiers de Science & Vie* (September 1999), 52-63.

24. "Martians and Other Aliens," *Studies in the History and Philosophy of the Biological and Biomedical Sciences*, 30(1999), 237-254. (Essay Review).
25. "Engines of Discovery: Scientific Instruments and the History of Astronomy and Planetary Science in the United States in the Twentieth Century," *Journal for the History of Astronomy*, 28(1997), 49-77.
26. "The History of Large Scale Science in the United States in the Twentieth Century," in *The Encyclopedia of the United States in the Twentieth Century*, (Charles Scribner's Sons 1996), Stanley Kutler (editor-in-chief), volume 2, 739-765.
27. "Counting on Invention: Devices and Black Boxes," in *Very Big Science*, *Osiris*, 9(1994), 101-123, coauthored with J. Tatarewicz.
28. "Overview," and chapter on "Red Shifts and Gold Medals," in *The Explorers of Mars Hill: A Centennial History of Lowell Observatory 1894-1994*, (Phoenix Publishing, 1994), William Lowell Putnam (editor), xiii-xix, and 43-65.
29. Chapters on "Raw Power: Nineteenth Century Speculum Metal Reflecting Telescopes," and "Cosmology 1900-1931," in *Cosmology: Historical, Literary, Philosophical, Religious, and Scientific Perspectives* (Garland, 1993), N. Hetherington (editor), 289-300 and 329-346.
30. "The History of Big Science," in *Megascience and Its Background* (Organization of Economic Cooperation and Development, Paris, 1993), 9-23.
31. "Big Science, Competitiveness, and the Great Chain of Being," in *Technological Competitiveness: Contemporary and Historical Perspectives on the Electrical, Electronic, and Computer Industries* (IEEE Press, 1993), W.A. Aspray (editor), 90-99.
32. "Negotiating a Discovery: Neptune in America," *Journal for the History of Astronomy*, 13(1992), 261-91, coauthored with J. Hubbell.
33. "The Biggest Kind of Big Science," in *Big Science*, (Stanford University Press, 1992), Peter Galison and Bruce Hevly (editors), 184-211.
34. "Astronomy in the Nineteenth and Twentieth Centuries," in *Storia Delle Scienze Fisiche E Astronomiche* (Electra Press, 1992), William R. Shea (editor), 542-93.
35. "A National Observatory Transformed: Greenwich in the Nineteenth Century," *Journal for the History of Astronomy*, 22(1991), 5-20.

36. "Selling the Space Telescope: The Interpenetration of Science, Technology, and Politics," in *A Spacefaring Nation*, (Smithsonian Institution Press, 1991), M. Collins and S. Fries (editors), 29-62.
37. "Edwin P. Hubble and the Transformation of Cosmology," *Physics Today*, 43(1990), 52-60 [this paper was translated into Dutch for publication in *Intermediar* as well as into Japanese. It has also been published in an anthology of papers entitled *The Life and Times of Modern Physics* (American Institute of Physics, 1992).]
38. "The Cambridge Network in Action: The Discovery of Neptune," *Isis*, 80(1989), 395-422.
39. "Replacing a Technology: The Large Space Telescope and CCDs," *Proceedings of the IEEE*, 73(1985), 1221-35, coauthored with J. Tatarewicz.
40. "Studies of the Milky Way 1850-1930," being pp. 43-58 in *The Milky Way Galaxy*, (Reidel, 1985), H. van Woerden et al (editors).
41. "Lassell and the Ring of Neptune," *Journal for the History of Astronomy*, 15(1984), 1-17. I was lead author of this paper written with R. Baum.
42. "Lassell and the Discovery of Neptune," *Journal for the History of Astronomy*, 14(1983), 30-2.
43. "The Hartnup Balance," *Antiquarian Horology*, 14(1983), 39-45.
44. "The Impact on Astronomy of the Discovery of Uranus," in *Uranus and the Outer Planets* (Cambridge University Press, 1982), Garry Hunt (editor), 81-9.
45. "The Origins of the Velocity-Distance Relationship," *Journal for the History of Astronomy*, 10(1979), 133-65.
46. "Russell and Stellar Evolution," in *Russell and Stellar Evolution*, (Dudley Observatory, 1977), 9-18.

Editorial Responsibilities

Advisory Editor for *The Journal for the History of Astronomy*, 2009-present.

Member of Editorial Board for Pickering and Chatto Series on Science and Culture in the Nineteenth Century, 2005-present.

Advisory Editor, *Isis*, 2012 to 2015.

Other Dictionary and Encyclopedia Entries

Entry on “Edwin Powell Hubble,” in *Encyclopaedia Britannica* (uploaded 2009), 1,300 words.

Entries on William Lassell and John Hartnup for the *New Dictionary of National Biography* (Oxford University Press, 2004), 900 and 940 words.

Entries on a variety of topics in the *Encyclopedia of the History of Astronomy* (Garland, 1997), J. Lankford (editor). Includes interpretive essays several thousand words in length on the histories of “Galaxies and “Modern Cosmology.”

Entries on a variety of topics in the *Encyclopedia of Cosmology* (Garland, 1993), N. Hetherington (editor). These include essays on “Cosmology 1900-1931” and “Raw Power: Nineteenth Century Speculum Metal Reflecting Telescopes.” These two essays were adapted from the book *Cosmology: Historical, Literary, Philosophical, Religious, and Scientific Perspectives* listed above as item # 22.

Entries on the H-R Diagram, Stellar Populations, Astrophysics, Astronomical Photography, White Dwarfs, The Galaxy, Galactic Rotation, Interstellar Absorption, Newtonian Cosmology, The Chamberlin-Moulton Hypothesis, The Steady State Theory, Novae and the Expanding Universe in *The Dictionary of the History of Science*, (Macmillans, 1981), edited by W.F. Bynum, E.J. Browne, and R. Porter. This has been published in paperback as well as in a number of languages.

Book Reviews

Reviews published in:

Albion

American Scientist

Annals of Science

British Journal for the History of Science

Bulletin for the History of Medicine

Canadian Reviews in American Studies

Canadian Journal of History

H-NET

Historical Studies in the Physical and Biological Sciences

History of Science

Isis

Journal of American History

Journal of Astronomical Heritage and History

Journal of the British Society for the History of Science

Journal for the History of Astronomy

Metascience

Museums Journal

Nuncius
Philosophy in Review
Physics Today
Public Historian
Science
Scientia
Studies in the History and Philosophy of the Biological and Biomedical Sciences
Studies in History and Philosophy of Modern Physics
Technology and Culture
Times Higher Educational Supplement
Victorian Studies

TEACHING

Undergraduate Courses Taught

HIST 270: The History of Science, Technology and Medicine. Sources in the History of Science
 HIST 293: History of Science, Technology and Medicine: Key Moments
 HIST 294: An Introduction to the History of Science, Technology and Medicine: Survey
 HIST 296: World War II
 HIST 394: History of Astronomy and Cosmology: Stonehenge to the Space Age
 HIST 398: History of Science II: Newton to the Large Hadron Collider
 HIST 486: Topics in the History of Technology (History of Spaceflight)
 HIST 496: Topics in the History of Science (taught at different times `The History of Big Science. And `The History of the Extraterrestrial Life Debate.`
 STS 400: Advanced Topics in Science, Technology and Society

Taught at The Johns Hopkins University:

The Wright Brothers to the International Space Station: The History of Aviation and Spaceflight.

The History of Astronomy and Cosmology

Undergraduate Supervision

Kayla Atkey, Roger S. Smith Undergraduate Research Award, Summer of 2009, topic "Opposition and Dissent in Big Science."

Graduate Courses Taught

HIST 603: The History of Historical Writing
 HIST 696: Topics in the History of Science

Taught at The Johns Hopkins University:

The Atomic Age
 Scientific Instruments and their Institutions.
 History of Cosmology.

Postdoctoral Fellow Supervision

Alexandra Choby: Postdoctoral Fellow, Science, Technology and Society Program, 2009-11.

M.A. and Ph.D Student Supervision

Shanshan Chu, Institute for the History of the Natural Sciences, National Academy of Sciences, Beijing (served as advisor during Ms. Chu's tenure as an exchange student at the University of Alberta 2014-15). She completed her Ph.D. on the history of radio astronomy in China in 2016.

Ke-Xin Au Yong (co-supervised with J. Jay), Ph.D., *State Mathematics in Thirteenth Century China*, continuing.

T. Rockwell, Ph.D., 2012, *Space Propaganda "For All Mankind"*

K. Zwicker, Ph.D. 2012, *Radiation, Researchers, and the United States Atomic Energy Commission: Biomedical Research from the Early Twentieth Century to the Early Cold War*

C. Gainor, Ph.D., 2011, *The United States Air Force and the Emergence of the Intercontinental Ballistic Missile 1945-1954*

M. Eisler, Ph.D., 2008, *The History of Hydrogen Fuel Cells*

J. Bridges, M.A., *The History of Astronomy in Wales in the Nineteenth Century*, continuing.

K. Mullen, M.A., *Gender Issues in Twentieth Century American Science* (tentative topic), continuing.

K. Zwicker, M.A., 2003, *The Manhattan Project and Safety Issues*

M. Kahl, M.A., 2001, *Edwin P. Hubble's Interpretations of Redshifts in Extragalactic Nebulae*

M. Eisler, M.A., 2001, *The Strategic Defence Initiative as a Military Research Complex*

Jennifer Tucker, Ph.D., 1997, The Johns Hopkins University, 1997. *Science Illustrated: Photographic Evidence and Social Practice in England, 1870-1920*

Barbara Becker, Ph.D., 1993, The Johns Hopkins University, 1993. *Eclecticism, Opportunism, and the Evolution of a New Research Agenda: William and Margaret Huggins and the Origins of Astrophysics*

John Hubbell, M.A., 1998, The Johns Hopkins University, 1989. *The Discovery of Neptune in America*

Other Graduate Student Involvement (last decade)

Apps, Lara: History and Classics, Ph.D. Committee member and examiner, 2015.

Devon Lemie: History and Classics, Coursework M.A. Examiner, 2015.

Glaznow, Michael: Sociology, PhD. Committee member for 'specialization exam,' 2014.

Koo, Jean: Dept. of Humanities, York University, external examiner for Ph.D. examination, 2013.

Robertson, Lisa Ann: English and Film Studies, member of examining committee for Ph.D. examination, 2013.

Durnford, Robin: English and Film Studies, member of examining committee for Ph.D. examination, 2013.

Lech Lebedowski: History and Classics, Ph.D. Committee Member, completed 2011.

Sara Kowalski: Art and Design, M.A., Member of Examining Committee, 2010.

Amit Sharma: History and Classics, Second Reader on M.A. thesis, 2009.

Lisa Robertson: English and Film Studies, Candidacy Examining Committee, 2009.

Anna O'Brien: History and Classics, M.A., Examining Committee, 2009.

MAJOR GRANTS

2014-2018: Principal investigator for Canadian Space Agency grant for study of the history of space astronomy \$50,000.

2007-2015: University of Alberta 'Node Manager' for \$2.1 Million SSHRC Cluster Grant, 'Situating Science.' [The Cluster Grant involved seven universities across Canada].

2007-2013: Principal investigator for Canadian Space Agency grant for study of the history of space astronomy \$70,000.

2003-2007: Principal Investigator for Canadian Space Agency grant for study of the history of the James Webb Space Telescope, \$49,000 (CDN).

2003-7: Co-Investigator on NASA Grant of \$29,000 for study of the history of Space Astronomy (with Patrick McCray, University of California-Santa Barbara as Co-I).

2000-2002: Principal Investigator for Canadian Space Agency grant for study of the history of the James Webb Space Telescope, \$40,000 (CDN).

1997-2001: U.S. National Science Foundation, grant for history of the telescope (with J.A. Bennett and A. Van Helden) \$28,000 (U.S.).

1986-88: U.S. National Science Foundation, grant for "Space Telescope History Project" \$65,000 (U.S.).

SCHOLARLY PRESENTATIONS (Select List from the Last Decade)

"Across the Divide," Invited Lecture, American Physical Society, Washington DC, USA, 2017.

"...the greatest thing in history!" Hiroshima and the Atomic Age Conference, "70 Years After Hiroshima: Nuclear Issues in Global Contexts", University of Alberta, 2015.

"The Perils of Presentism: The Case of British Astronomy in the Long Nineteenth Century" at the 12th Biennial History of Astronomy Workshop at the University of Notre Dame, USA. 2015.

"The Nineteenth Century Observatory as Laboratory," at Workshop on 'Spaces of Science,' University of Saskatoon, 2014

"A One-Galaxy Universe and the Shift to Modern Cosmology," at a special session on the "Origin of Structure and the Expanding Universe," Historical Astronomy Division of the American Astronomical Society, Washington DC, 2014.

"The Second Wave: Physicists and the Remaking of Astronomy After World War II" in session on "Knowledge between transmission and local cultural boundaries: Migrating scientists and physicians in the 20th century" at the International Congress of the History of Science, Manchester, England, 2013.

"The Great Plan of the Visible Universe': Huggins and Natural Theology," paper presented in session on "Discovery and Classification in Astronomy," at the Eleventh Biennial History of Astronomy Workshop, University of Notre Dame, U.S.A., 2013.

"William Huggins, Evolutionary Naturalism and the Nature of the Nebulae," in session on "The 'Evolution' of Victorian Science," Annual Meeting of the Canadian Society for the History and Philosophy of Science, Victoria, B.C., 2013.

"The Road to Radial Velocities: V.M. Slipher and Mastery of the Spectrograph," conference on the "Origins of the Expanding Universe: 1912-32," Flagstaff, Arizona, U.S.A., 2012.

"Evolutionary Naturalism and the Study of the Nebulae." Annual meeting of the History of Science Society, Cleveland, U.S.A. 2011.

"Making Science Big: From Little Science to Megaprojects?," George Sarton Memorial Lecture in the History and Philosophy of Science on behalf of the History of Science Society at the Annual Meeting of the American Association for the Advancement of Science, 2012.

Invited talks on "The Herschels and the Nebulae" and "The Discovery of Neptune," to special sessions of the Historical Astronomy Division of the American Astronomical Society, annual meeting of the American Astronomical Society, Seattle, U.S.A., 2011.

"Space Astronomy and the Cold War," International Congress of the History of Science and Technology, Budapest, Hungary, 2009.

"Remaking Space Astronomy," Biennial Workshop in the History of Astronomy, University of Notre Dame, U.S.A., 2009.

"When is an Observatory a Laboratory? Remaking Astronomical Practice in the Nineteenth Century," Fifth Laboratory History Conference, The Johns Hopkins University, Baltimore, U.S.A., 2009.

"The Expanding Universe: Remaking Cosmology in the 1920s and 1930s and the Nature of Discovery," University of Washington, Seattle, 2008.

“Space Astronomy as Very Big Science,” conference on “400 Years of Astronomical Telescopes,” European Space Agency, Noordwijk, Holland, 2008.

“Remaking Cosmology in the 1930s,” Canadian Society for the History and Philosophy of Science, Annual Meeting, Vancouver, 2008.

“The History of the James Webb Space Telescope,” National Air and Space Museum, Smithsonian Institution, Washington DC, 2007.

OTHER PRESENTATIONS (Last Decade, Select List)

"An epoch in the history of astronomy": Remaking the Galaxy', Royal Netherlands Academy of Arts and Sciences, Amsterdam, the Netherlands, June 2016.

“The Hubble Space Telescope: The Agony and the Ecstasy,” National Air and Space Museum, Smithsonian Institution, Washington DC, 30 June 2015.

“*Fallout! The Aftermath*,” panel member for discussion at the Provincial Archives of Alberta, 3 June 2015.

“Getting to Orbit,” Philosophical Society of Washington DC, 20 April 2015.

"A 'Most Spirit Stirring Event:' The Discovery of Neptune and Why It Sparked A Firestorm of Controversy," Cincinnati, USA, 2014. [Craig Waff Commemoration Meeting]

Panel participant for discussion and questions following selected readings from Michael Frayn's play *Copenhagen*. On stage with the actors and other panel members. Ottawa, 2013.

"Making Science Big: From Little Science to Megaprojects?," George Sarton Memorial Lecture in the History and Philosophy of Science on behalf of the History of Science Society at the Annual Meeting of the American Association for the Advancement of Science, Vancouver. 2012.

“Tim Hawarden and Passively Cooled Space Telescopes,” Royal Observatory, Edinburgh, Scotland, 2010.

“The Early History of the James Webb Telescope,” Canadian Space Agency Headquarters, Montreal, 2010.

On stage at the Citadel's Rice Theatre with the playwright for a "Talkback" session after a public reading of Vern Thiessen's play *Lenin's Embalmers*, 2009.

"Galileo's Telescope," public presentation at the Telus World of Science Edmonton in connection with the start of the International Year of Astronomy, 2009.

In 2008/9 I gave a series of three connected talks on the history of the telescope to the Edmonton Branch of the RASC, all at the Telus World of Science Edmonton, to mark the 400th anniversary of Galileo's first use of the telescope, September 2008, February 2009, and May 2009.

"The Extraterrestrial Life Debate," University of Alberta Alumni Association, 2008.

REFEREEING

Refereed papers submitted to *American Quarterly*, *American Scientist*, *Annals of Science*, *British Journal for the History of Science*, *Diplomacy and Statecraft*, *History of Science*, *Isis*, *Journal for the History of Astronomy*, *Journal of American History*, *Science in Context*, *Science and Education*, *Social Studies of Science*, *Technology and Culture*, and *Physics Today*, as well as grant applications on behalf of Social Science and Humanities Research Council of Canada, the National Science Foundation, the National Endowment for the Humanities, the National Humanities Center, the Woodrow Wilson Center, the Guggenheim Foundation, the Smithsonian Institution, the Science Museum (London), and the Dutch national funding agency for history of science.

Adviser on the publication of book manuscripts to the University of Arizona Press, Brill, the University of California Press, Cambridge University Press, the University of Chicago Press, Columbia University Press, the University of California Press, Harcourt Brace, The Johns Hopkins University Press, the Oxford University Press, Pickering and Chatto, Princeton University Press, Rutgers University Press, University of Pittsburgh Press, University of Texas Press, University of Toronto Press, and Yale University Press.

2004: Served as expert referee for the National Academy of Sciences study *Assessment of Options for Extending the Life of the Hubble Space Telescope* (National Academy of Sciences, Washington DC, 2004).

MAJOR SERVICE ACTIVITIES

University of Alberta 'Node' Manager for SSHRC Grant on 'Situating Science,' 2007 to 2015.

Member of the Organizing Committee for Conference on "The Local Group," Seychelles, 18-24 May 2014.

Member of the Organizing Committee for conference on "The Origins of the Expanding Universe: 1912-32," Flagstaff, Arizona, 12-15th September 2012.

Member of Davis Prize Committee, History of Science Society Book Prize, 2011-2013 (Committee chair 2013).

External reviewer, St. Thomas's University proposed Bachelor of Arts, Honours major in STS Studies, 2012.

Member of the American Historical Association/NASA Fellowship Committee (to select postdoctoral fellow in Aerospace History), 2007-12.

Program Committee, Canadian Society for the History and Philosophy of Science, 2004-7.

Chair, Department Head's Committee, Canadian Historical Association, 2000-2001.

Contributing editor to *Air and Space Magazine*, 1996-2009

Advisor to *Soundprint*, 1999 to 2009, various projects.

Member of Advisory Board to Center for History of Physics, American Institute of Physics, 1993-1998.

Member of Advisory Committee to the American Institute of Physics' Center for History of Physics Project on 'Multi-Institutional Collaboration in Modern Science,' 1990 to 1995.

Chair of History of Science Society's North American Committee of the Dibner Visiting Historians of Science Program, 1991-3.

Member of Advisory Board of Lowell Observatory, Flagstaff, Arizona, 1988 to 1995.

Participant in conference on 'Beginning a Dialogue on the Changing Environment for the Physical and Mathematical Sciences,' organized by the National Research Council, 1993.

Consultant on the history of Big Science to the Organization of Economic Cooperation and Development, Paris, 1991/92.

Member of Office of Technology Assessment Workshop on *Setting Priorities in NASA*, 1991.

Member of Archives Advisory Panel for the Keck Observatory of the Californian Association for Research in Astronomy, 1988-89.

Member of Office of Technology Assessment Workshop on the Human Genome Project, 1988.