

## Garth D. Illingworth

### Resume Summary

Astronomer/Professor of Astronomy  
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Born: Perth, Western Australia Citizenship: U.S.

### ACADEMIC HISTORY

1965–1968 B.Sc. (Honors) 1st Class (Physics), University of Western Australia, Perth, WA  
1969–1973 Ph.D. (Astrophysics) Australian National University, Mount Stromlo and Siding Spring Observatory  
2010 D.Sc. (h.c.), University of Western Australia, Perth, Western Australia

### POSITIONS HELD

1974–1975 Postdoctoral Fellow, Kitt Peak National Observatory, Tucson, Arizona  
1976–1977 Miller Fellow, Department of Astronomy, University of California, Berkeley  
1978–1984 Astronomer, Kitt Peak National Observatory, Tucson, Arizona  
1984–1987 Deputy Director, Space Telescope Science Institute, Baltimore, Maryland  
1985–1987 Research Professor, Department of Physics and Astronomy, JHU  
1988– Astronomer, University of California Observatories/Lick Observatory  
1988– Professor, Department of Astronomy and Astrophysics, UCSC

### MAJOR ACTIVITIES/ACHIEVEMENTS

1. Science 1: Major ongoing programs on galaxy formation and evolution formation at high redshift (from  $z \sim 2 \sim 10$ ; recent focus on galaxy formation and evolution in the reionization epoch – during the first Gyr). Large number of publications with small team. Extensive *Hubble Space Telescope (HST)*, *Spitzer*, *Keck*, *VLT* and *Magellan* observing time and collaborations. PI of HUDF09 *HST* WFC3/IR program—top-ranked and largest program awarded by Cycle 17 *HST* TAC. PI of *eXtreme Deep Field (XDF)* and *Hubble Legacy Fields (HLF)*. *XDF* combines 10 years of *HST* ACS and WFC3/IR data in the deepest field ever (to 31 mag  $5\sigma$ ).
2. Science 2: Numerous science talks at international workshops on galaxy evolution in the first 1–2 Gyr. Organized high redshift galaxy workshops. Many press releases and interviews on new results with outstanding international visibility (last release: 116 articles with >600 million potential readers!). Lead organizer of Aspen Physics “Reionization” workshop. Highly-visited “firstgalaxies” website top-rated in searches on early galaxies <http://firstgalaxies.org/>
3. AAAC: Chair, Congressionally chartered Astronomy and Astrophysics Advisory Committee (AAAC) from 2004 to 2008. AAAC is FACA committee whose annual report is to NSF, NASA and DOE, to Congress and to OMB/OSTP. Annual reporting to agency (NSF, NASA, DOE) senior management, OSTP Director and Congressional staff. Set up four major Task Force studies: Exo-Planets; Dark Energy; CMB Polarization; Dark Matter Direct Detection.

4. Awarded 2016 Berkeley Prize by AAS — Lecture: *The most-distant galaxies viewed by the Hubble Space Telescope*
5. ICRP: Member, 2010 *JWST* Independent Comprehensive Review Panel (ICRP) 2010; only scientist on ICRP; Chair John Casani and Garth Illingworth represented ICRP's findings to NASA leadership and Congress.
6. JSTAC: Chair, 2009–, *James Webb Space Telescope* Science Advisory Committee (JSTAC). JSTAC is charged with advising STScI on maximizing the science return from JWST. Numerous letters regarding recommendations at <http://www.stsci.edu/jwst/advisory-committee>
7. Congressional Hearing Witness, House Science Committee: 2007 – Invited Witness, House Committee on Science and Technology's Subcommittee on Space and Aeronautics Hearing on "NASA's Space Science Programs"; 2011 – Invited Witness, Hearing "The Next Great Observatory: Assessing the James Webb Space Telescope".
8. NGST: One of original initiators, with Peter Stockman and Pierre Bely of the *JWST* concept—*Next Generation Space Telescope (NGST)*—in 1987-91. Chaired the "UV-Optical in Space Panel" of the 1990 Decadal Survey that recommended a 6-m passively-cooled large space telescope. Not accepted by the 1990 Decadal committee, but ultimately NGST grew into the NGST recommended in the 2000 Decadal, and then renamed to JWST.
9. HST ACS: Deputy PI, *HST* Advanced Camera for Surveys (ACS): Worked closely with PI Holland Ford towards the successful completion and launch of the most powerful optical imager on *HST*. Improved *HST*'s performance by 10X.
10. TPF-C STDT: Member, 2004 to 2006, Terrestrial Planet Finder Coronagraph Science Technology Definition Team (TPF-C STDT)—planning search for exoplanets using space coronagraph/nuller.
11. NHST/VLST: Co-organizer, 2002 with Rob Kennicutt of major workshop ("*Hubble's* Science Legacy") sponsored by NASA, ESA, AURA and U. Chicago on science issues and technical challenges for a large space telescope successor to *HST*. Proceedings and NASA HQ White Paper. PI of large study proposal on similar topic *Scalable Concepts for large UV-Optical Telescopes in Space* with scientists/engineers/managers/astronauts from universities, NASA centers and industry. Concept for *Very Large Space Telescope (VLST)* developed in proposal. Member, Organizing Committee, 2004, VLST workshop STScI.
12. TMT SAC: Chair/Co-Chair, 2009–, Thirty Meter Telescope Science Advisory Committee (TMT SAC).
13. ESO VC: Chair, 2010, ESO Visiting Committee
14. SScAC: Member, 2002-2005, SScAC, NASA Space Science Advisory Committee; Member, 2004, APS/POPA Task Force on NASA funding for Astrophysics
15. Spitzer TAC: Chair, 2004, *Spitzer* TAC (GO TAC)
16. STIC/AURA Board: Chair, 1998 to 2002, Space Telescope Institute Council (STIC); Member, AURA Board of Directors.

17. NRC/NAS Chair, "UV/Optical in Space" Panel of 1990 Astronomy and Astrophysics Survey Committee
18. NRC/NAS: Member, 1995, SSB "Task Group on BMDO New Technology Orbital Telescope"

## PROFESSIONAL ACTIVITIES

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| 2016          | Chair, Organizing Committee for Aspen Center for Physics Winter workshop on <i>The Re-Ionization Epoch: New Insights And Future Prospects</i>                                      |
| 2016          | Delivery of HLF-GOODS-S to MAST science data product database at STScI; HLF dataset is 5.7 Msec of HST image data in 7076 exposure (2/3 of a year of data).                        |
| 2015–<br>2015 | Co-Chair, Center Director's External Team (CDET) for JWST<br>Chair, STScI Director Search Committee  |
| 2014          | Member, AURA President Search Committee  |
| 2011–2016     | Highest redshift galaxy team results leading to several press releases.  |
| 2012–2014     | Organizer/coordinator with others to ensure UCO/Lick Observatory future.   |
| 2012          | Delivery of HUDF/XDF to MAST science data product database at STScI; XDF dataset is deepest Hubble image ever taken.   |
| 2011          | Invited Witness, House Committee on Science and Technology's Subcommittee on Space and Aeronautics, Hearing "The Next Great Observatory: Assessing the James Webb Space Telescope" |
| 2010          | Chair, ESO Visiting Committee  |
| 2010          | Member, JWST Independent Comprehensive Review Panel (ICRP)   |
| 2009–         | Chair, JWST Science Advisory Committee (JSTAC)   |
| 2008–         | Co-Chair, TMT Science Advisory Committee (TMT SAC)   |
| 2008          | Invited Speaker, European Union Astronet Final Workshop (EU Decadal Planning Study)—on "US Astronomy program"  |
| 2004–2008     | Chair, AAAC, Astronomy and Astrophysics Advisory Committee   |
| 2007          | Invited Witness, House Committee on Science and Technology's Subcommittee on Space and Aeronautics Hearing on NASA's Space Science Programs  |
| 2007          | Review Talk on the "Highest Redshift Galaxies," Heidelberg Workshop on "Galaxy Growth in a Dark Universe"  |
| 2007          | Invited talk and Discussion Panel Member for UC Berkeley Lyot Symposium  |
| 2007          | Invited Speaker, EU Astronet Workshop—on "Status of US Astronomy program"  |
| 2007          | Detailed contribution to National Academy on 2010 Astronomy Decadal Survey   |
| 2007          | Invited Speaker, NRAO 50 <sup>th</sup> Anniversary Science Symposium   |
| 2007          | Organizer/Leader of Public Policy Session AAS Seattle on AAAC report   |
| 2007          | Panel Participant Public Policy Session AAS Seattle on NASA  |
| 2006–2007     | Member, CAPP, AAS Committee on Astronomy and Public Policy   |
| 2006          | Invited talk on High Redshift Universe at the "Texas in Melbourne" Symposium   |
| 2006          | Developed with Dan Magee and Rychard Bouwens very popular "firstgalaxies" website.   |
| 2006          | Extensive Interview for BBC Radio 4 with BBC radio group in visit to Santa Cruz  |
| 2006          | Invited Speaker, SPIE, "Large Telescopes" Meeting. Talk on "US Astronomy Program and Decadal Survey"   |
| 2005–2007     | Reports to House Science Committee staff on AAAC Annual Report   |
| 2005–2007     | Reports to agency (NSF, NASA) management on AAAC Annual Report   |
| 2005–2007     | Presentations at CAA, BPA, OSTP, AURA (and other meetings) on AAAC report  |
| 2005–2007     | Editor, with committee, AAAC Annual Report for Congress and Agencies   |
| 2004–2008     | Member, AAAC, Astronomy and Astrophysics Advisory Committee  |
| 2004–2006     | Member, TPF–C Science Technology Definition Team   |

- 2004–2006 Member, Nominating Committee, Aspen Center for Physics
- 2004 Member, APS/POPA Task Force on NASA funding for Astrophysics
- 2004 Chair, *Spitzer* TAC (GO TAC)
- 2004 Member, Admissions Committee, Aspen Center for Physics
- 2003–2009 General Member, Aspen Center for Physics
- 2003–2006 Part of numerous STScI press releases on science results from *HST* and *Spitzer*
- 2002–2005 Member, SScAC, NASA Space Science Advisory Committee
- 2002–2003 Member, National Astronomy and Astrophysics Advisory Committee (NAAAC)
- 2000–2008 Member, AURA Board of Directors
- 1999–2001 Member, AAS Tinsley Prize Committee
- 1999–2000 Member, *HST* Second Decade Study Committee
- 1999 Member, AURA President Search Committee
- 1999 Member, NGST Instrument Study Team
- 1998–2002 Chair, Space Telescope Institute Council
- 1997–2008 Member Representative, Aura (University of California Representative)
- 1997–1998 Member, AURA Board Search Committee for Space Telescope Science Institute Director
- 1996–2002 Member, Space Telescope Institute Council
- 1995– Deputy PI, *HST* Advanced Camera
- 1995–1996 Member, Aura Board (University of California Representative)
- 1995 *HST* TAC Panel on “Cosmology, Cluster and Distant Galaxies”
- 1995 Member, NRC SSB “Task Group on BMDO New Technology Orbital Telescope”
- 1995 Chair, Space Telescope Science Institute Deputy-Director Search Committee
- 1994–1995 Member, NASA HQ UVMOWG
- 1994 Presentation to “*HST* and Beyond” Committee on Optical/UV/IR Space Telescopes
- 1993–1999 Co-Chair, Keck Telescope Science Steering Committee
- 1993–1996 Member, NASA Planetary Systems Science Working Group
- 1993–1995 Special Invitee, NASA Keck Review Team
- 1993 Co-I. on proposal to ESA for Joint NASA–ESA development of *HST* Advanced Camera
- 1993 Co-I. on POST Program
- 1992–1994 Development of Deep Program at Center for Particle Astrophysics and support of Center Reviews
- 1992 *HST* Second Generation Instrument Review Team
- 1992 Presentation at NSF, Washington, DC on DEEP Project
- 1991–1999 Member, Keck Telescope Science Steering Committee
- 1991–1993 JPL special review panel for *HST* replacement camera, WFPC–2, chaired by Charles Townes
- 1991–1993 NASA Planetary Program “Towards Other Planetary Systems Science Working Group”
- 1991 Presentations on Distant Galaxy Cosmology Projects for Center for Particle Astrophysics retreats, with D. Koo and S. Faber.
- 1991 Presentation to NASA HQ Planetary Division PSSWG (Science Working Group) on Status of Keck Telescope, January 1991 PSSWG meeting in Washington, DC
- 1990–1992 Chair, NGST SEWG (Next Generation Space Telescope Science-Engineering Working Group) to oversee technology development program for future large space telescope
- 1990–1991 Co-chair, Keck Telescope Science Steering Committee
- 1990 Executive Invitee for April Launch of *Hubble Space Telescope*, Kennedy Space Flight Center, Florida

- 1990 Presentation to NASA UV-Visible-Relativity Management Operations Workshop Group on results of “Next Generation Space Telescope” Workshop, Washington, DC
- 1990 Presentation to NASA Astronomy Management Operations Working Group of projected “UV-Visible Space Mission Program Plan for the 1990’s,” Washington, DC
- 1990 Presentation to Marshall Space Flight Center Advanced Projects Group and to Upper Management on “Next Generation Space Telescope,” Huntsville, Alabama
- 1989–1990 Chair, “UV-Optical In Space “ Panel of Astronomy and Astrophysics Survey Committee: Pre-decade Review of 1990’s Science Program, sponsored by NASA, National Science Foundation and Department of Energy, implemented under the auspices of the National Academy of Sciences, Washington, DC
- 1989–1990 Chair, “UV/Optical in Space” Panel of Astronomy and Astrophysics Survey Committee
- 1989 Presentation to NASA UV-Visible-Relativity Management Operations Working Group of plans for workshop and concepts for future space observations, Columbia, Maryland
- 1988–1989 Chair, Scientific Organizing Committee for Workshop on “The Next Generation: A Successor to *Hubble Space Telescope*” sponsored by NASA Headquarters and Space Telescope Science Institute, Baltimore
- 1987–1990 Member, Keck Telescope Science Steering Committee
- 1987–1990 Chair, Keck Telescope Segment Acceptance Committee
- 1987–1989 NASA Headquarters UV-Visible-Relativity Management Operations Working Group Executive Committee, *Hubble Space Telescope* Maintenance and Refurbishment Workshop, Goddard Space Flight Center, Greenbelt, Maryland
- 1987 Executive Committee, *Hubble Space Telescope* Maintenance and Refurbishment Workshop, Goddard Space Flight Center, Greenbelt, Maryland
- 1986–1987 Co-Chair, *Hubble Space Telescope* Science Certification Review

## PUBLICATIONS and SCIENCE

See <http://www.ucolick.org/~gdi/>

**Over 70 publications, many highly cited, since 2010 (largely on high redshift galaxies; most within the reionization epoch in the first Gyr). Several press releases on the discoveries.**