

**GARTH ILLINGWORTH**

Distinguished Professor of Astronomy/Astronomer Emeritus  
 Department of Astronomy and Astrophysics; UCO/Lick Observatory  
 University of California, Santa Cruz, California 95064  
 +1 831.459.2843 [gillingw@ucsc.edu](mailto:gillingw@ucsc.edu) [gdi@ucolick.org](mailto:gdi@ucolick.org)  
<http://www.ucolick.org/~gdi/> <http://firstgalaxies.org>

1969–1973 Ph.D. (Astrophysics) Australian National University, Ken Freeman, Supervisor  
 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  
 1988–2017 Astronomer, University of California Observatories/Lick Observatory  
 1988–2017 Distinguished Professor, Department of Astronomy and Astrophysics, UCSC  
 2010 D.Sc. (h.c.), University of Western Australia, Perth, Western Australia  
 2017– Distinguished Professor of Astronomy/Astronomer Emeritus, Department of Astronomy and Astrophysics/University of California Observatories, UCSC

**BIO SUMMARY**

Garth Illingworth was the leader of the early work, in 1987-1992 with Peter Stockman and Pierre Bely, on the Next Generation Space Telescope (NGST) that is now known as the James Webb Space Telescope (JWST). While Deputy-Director of the Space Telescope Science Institute (STScI) in Baltimore, he was one of original initiators of a large 8-m class passively-cooled infrared space telescope. After moving to UCSC from STScI in 1988, he helped build the case for NGST to provide insights into the most distant galaxies, noting that key goal in 1988 in a talk at the IAU in Baltimore. That initial primary science goal of “distant galaxies”, set in place in 1988 even before Hubble flew, eventually became the core scientific rationale of “First Galaxies” on which NGST/JWST was funded and built. He co-organized the first ever workshop on NGST *The Next Generation: A 10 m Class UV-Visible-IR Successor to HST*. Garth subsequently chaired the *UV-Optical in Space Panel* of the 1990 Astronomy Decadal Survey that recommended a 6-m passively-cooled large infrared space telescope. The NGST concept developed further in the 1990s and ultimately became the JWST following the top-ranked recommendation for an 8-m NGST in the 2000 Astronomy Decadal Survey. He shepherded the project through many aspects of its long development, and when he finally celebrated Webb’s launch on December 25<sup>th</sup> 2021, he was the last original architect still involved.

Garth has focused his scientific endeavors on exploring for the earliest galaxies in the first billion years of the Universe. He began his career investigating the nature and dynamics of globular clusters in our Milky Way and nearby elliptical galaxies, but with the advent of the new opportunities provided by the powerful new instruments on Hubble in the early 1990s, he transitioned to working on distant galaxies. This search for the earliest galaxies over the last ~30 years has been enabled by the world’s most powerful telescopes, the Hubble and Spitzer space telescopes and the Keck telescope on Mauna Kea. He has continued this work on the “First Galaxies” with JWST in the past 1.5 years since the first data release on July 12, 2022.

Garth is a Distinguished Professor Emeritus in Astrophysics at the University of California, Santa Cruz. He was a Miller Fellow at UC Berkeley and in 2010 was awarded an honorary Doctor of Science degree at the University of Western Australia. He is the recipient of the 2016 American Astronomical Society Lancelot M. Berkeley New York Community Trust Prize for his work on the most-distant galaxies viewed with Hubble, and was a plenary speaker for this award at the 2017 meeting of the American Astronomical Society. He was the 2018 Bahcall Lecturer, giving a series of invited talks at the Space Telescope Science Institute, the Goddard Space Flight Center and the Smithsonian National Air and Space Museum. He is a Fellow of the American Astronomical Society.

## SCIENCE

- 1) **AAS Fellow 2021** for path-breaking studies of infant galaxies at the dawn of the universe, lifelong service to the astronomical community, and astute guidance on the national and international scene.
- 2) **One of the World's Most Highly Cited Researchers 2017, 2019, 2020, 2021, 2022, 2023, 2024** (by *Clarivate Analytics*) for work on the earliest galaxies in the universe using major survey programs, HUDF; HUDF09/12; XDF; HLF-GOODS-S and -N; HLF; ranked #143 in the world by *Research.com*.
- 3) **Science Scope: ADS Citations >50000; H-Index 124:** From Globular Clusters to nearby Galaxies to 25 years of work on High Redshift Galaxies. See: <http://www.ucolick.org/~gdi/>
- 4) **US Admin PI for two major JWST international programs – PRIMER and FRESCO** – for organizing US-based budgets and key activities as developed with the program PIs.
- 5) **Bahcall Lecturer 2018** at STScI, GSFC and NASM: *Galaxies at Cosmic Dawn: Exploring the First Billion Years with Hubble and Spitzer – Implications for JWST*.
- 6) **AIP Plenary Lecturer 2018:** Australian Institute of Physics Congress (AIP): *Galaxies at Cosmic Dawn: Exploring the First Billion Years with the Hubble Space Telescope*.
- 7) **TEDx 2018:** Perth Australia: *Hubble, the First Galaxies and JWST*.
- 8) **AAS 2016 Lancelot M. Berkeley New York Community Trust Prize** for work on *The Most-Distant Galaxies Viewed with Hubble*. Plenary Talk AAS 229 on *Exploring for Galaxies in the First Billion Years with Hubble and Spitzer – Pathfinding for JWST*.
- 9) **2022-2023 Numerous Public & Professional Talks on JWST Mission and Science**

## POLICY

- 1) **Deputy-Director STScI 1984-1987 (under Director Riccardo Giacconi):** Dealt with numerous policy, technical and scientific issues on pre-launch Hubble; developed NGST concept.
- 2) **NRC/NAS 1990 Decadal Panel Chair: UV/Optical in Space Panel** of the Astronomy and Astrophysics Survey Committee (Decade of Discovery). “[UV-Optical in Space Panel](#)” report.
- 3) **NRC/NAS 1995 Member for SSB: Task Group on BMDO New Technology Orbital Telescope.**
- 4) **AURA: Space Telescope Institute Council (STIC) Chair, 1998-2002.**
- 5) **AURA: Board of Directors, Member, 1998-2004:** nominated for Chair of BOD, but appointed AAAC Chair same year. Recognized CoI was an issue. Decided not to complete AURA process.
- 6) **NASA Space Science Advisory Committee (SScAC) 2002-2005:** NASA Astrophysics.
- 7) **Astronomy and Astrophysics Advisory Committee (AAAC) Chair 2004-2008:** Congressionally-chartered reporting to agency leadership NSF, NASA, DOE, + OSTP Director and Congress.
- 8) **AAAC Task Forces set up while AAAC Chair:** [Five major studies](#) were set up as AAAC Subcommittees while Chair: *Task Force on Cosmic Microwave Background Research* (TFCR) 2005; *Report on GSMT-JWST Synergy* 2005; *Dark Energy Task Force* (DETF) 2006; *Dark Matter Scientific Assessment Group* (DMSAG) 2007; *ExoPlanet Task Force* (ExoPTF) 2008.
- 9) **Spitzer TAC Chair, 2004:** *Spitzer* Time Assignment Committee (Chair of overall GO TAC).
- 10) **Congressional House Science Committee Hearing Witness 2007:** Invited Witness, House Committee on Science and Technology’s Subcommittee on Space and Aeronautics Hearing on “*NASA’s Space Science Programs*”.
- 11) **Congressional House Science Committee Hearing Witness 2011:** Invited Witness, Hearing “*The Next Great Observatory: Assessing the James Webb Space Telescope*”.
- 12) **JWST Independent Comprehensive Review Panel (ICRP) 2010:** Chair John Casani and Garth Illingworth represented ICRP’s findings to NASA and Congress. [The ICRP report is here.](#)
- 13) **JWST Science Advisory Committee (JSTAC). Chair 2009-2017:** JSTAC charged with advising STScI (and indirectly NASA) on maximizing the science return from JWST. Numerous letters from JSTAC regarding recommendations can be [found at this link](#).
- 14) **ESO VC Chair 2010:** ESO Visiting Committee for all ESO facilities.
- 15) **AURA: AURA President Search Committee, Member, 2014.**
- 16) **AURA: STScI Director Search Committee, Chair, 2015.**

- 17) **Co-Lead of JWST Center Directors External Team (CDET) 2015–** with Rick Howard; in part dealing with policy issues related to JWST mission – reporting to GSFC Center Director.
- 18) **Member and then Chair of GSFC Center Director’s Visiting Committee 2017–:** member, and now Chair since 2019, of the Goddard Center Director’s Visiting Committee.
- 19) **Co-Lead of RST/WFIRST External Group 2019–2022:** with Rick Howard; dealing with policy and mission issues for GSFC; now for HQ RST Program on WFIRST/Roman Space Telescope.

### MISSIONS/INSTRUMENTS

- 1) **NGST concept development, 1987-1992:** co-leader of Next Generation Space Telescope (NGST – now JWST) concept activities and developments with Peter Stockman and Pierre Bely. Large 8-m class passively-cooled optical-IR space telescope was the typical baseline concept.
- 2) **NGST/JWST workshops and reviews, 1989-1991:** Organized the first science conference in 1989 *The Next Generation: A 10 m Class UV-Visible-IR Successor to HST*.
- 3) **Chaired the “[UV-Optical in Space Panel](#)” of the 1990 Decadal Survey, 1990:** Panel recommended 6-m passively-cooled large space telescope.
- 4) **NGST Technical Concept Development Astrotech21, NASA HQ & JPL – 1990-1991:** NGST technologies with NASA HQ and JPL support – see *Workshop Proceedings: Technologies for Large Filled-Aperture Telescopes in Space* 1991. NGST chosen in the 2000 Decadal.
- 5) **Keck DEIMOS spectrograph 1990-93:** developed DEIMOS concept and led successful NSF proposal.
- 6) **Chair and Member Keck Science Steering Committee, 1989-1999:** responsible for instrument deliveries for Keck Telescopes.
- 7) **HST ACS Deputy PI, 1995-2007:** Advanced Camera for Surveys for Hubble (PI Holland Ford).
- 8) **NHST/VLST Workshop Co-organizer with Rob Kennicutt, 2002:** Organized [major workshop](#) (“Hubble’s Science Legacy”) sponsored by NASA, ESA, AURA and U. Chicago on science issues and technical challenges for a Very Large Space Telescope (VLST) successor to *HST*. Proceedings and NASA HQ White Paper.
- 9) **PI of “Scalable Concepts for Large UV-Optical Telescopes in Space” proposal, 2003:** with scientists/engineers/managers/astronauts from universities, NASA centers and industry. Concept developed in proposal for VLST observatory with assembly in space.
- 10) **Member, Organizing Committee, 2004:** VLST Workshop at STScI.
- 11) **NASA HQ/JPL TPF-C STDT: Member, 2004 to 2006:** Terrestrial Planet Finder Coronagraph Science Technology Definition Team (TPF-C STDT) – exoplanets with space coronagraph.
- 12) **TMT SAC Co-Chair/Chair, 2009-2018:** UC Co-Chair of TMT Science Advisory Committee, (SAC) and also overall Chair of SAC for 2010-2013.
- 13) **Co-Lead of JWST Center Directors External Team (CDET), 2015–:** with Rick Howard
- 14) **NGST/JWST Early History in STScI Newsletter, 2016:** [Newsletter article](#) overview of the early history of the development of NGST which became JWST.
- 15) **Co-Lead of RST/WFIRST External Group, 2019–2022:** with Rick Howard.
- 16) **Comprehensive paper on JWST architecture, 2024-25,** led by Pierre Bely: “Genesis of the James Webb Space Telescope Architecture: The Designers’ Story”, second author of 18..