The Future of Space Telescope Research and Cosmology at ASU

144hr HST+JWST on galaxy cluster (4 Bly). Press rel. Nov. 23: https://webbtelescope.org/contents/news-releases/2023/news-2023-146

SUMMARY: For the last 30 years, NASA's Hubble Space Telescope (HST) has become arguably the most successful science mission ever undertaken.

During its first year of operation, NASA's very successful James Webb Space Telescope (JWST) is now quickly outperforming HST.

(1) NEWS RELEASES BY THE HST & JWST COMMUNITY:

- NASA's Hubble Space Telescope (HST) had 1,100 science press releases since 1990, each with $\gtrsim$400 million readers (or impressions) worldwide.
- HST is the most publicized space astrophysics mission in NASA history.
- JWST: 70 NASA press releases since 2022, each 0.5–1 billion readers.
- JWST is now the most-in-demand space mission in NASA history.
- ASU Cosmology: 10 billion readers from 5 releases since 2022 (URL).

(2) SCIENTIFIC IMPACT BY THE HST & JWST COMMUNITY:

- HST: $\gtrsim$500–1000 refereed papers/year by the community since 1990.
- 44,100 HST papers on ADS, 875,100 citations since 1990, h$_{\boldsymbol{HST}}$=308!
- JWST: over 1000 refereed papers since July 2022 alone!
- In year 1, JWST already outdoing HST's yearly production significantly.
- $>$100 ASU grad students and many 100's of ASU UGs worked on HST since 1990. JWST+HST research in very high demand from UGs+grads:
- 12 ASU graduate students, 6 postdocs and research scientists, 33 UGs and 5 highschool students currently working on JWST.

(3) GRANT FUNDING FROM NASA's FLAGSHIP SPACE TELESCOPES:

- HST: 20–35 M$ NASA Guest Observer (GO) funding/year since 1990.
- JWST has 57 M$ NASA GO (FY23) funding/year since 2022.
- Since 1990, ASU (Cosmology) typically harvests at least several % of HST & JWST telescope time, funds, papers, & press releases per year.

(4) VISION FOR ASU's LONG-TERM SPACE ASTROPHYSICS FUTURE:

- The 2.4 meter HST may last until 2035.
- The 6.5 meter JWST has propellant until $>$2045.
- 1.2 m Euclid space telescope (2023–2035?); 2.4m Roman Space Telescope (2026–2040?); Habitable Worlds Observatory (6.5–11m HWO; late 2040's–2070's?).
- Each future mission will have 20–60 M$ of (FY23) NASA grant funding/year, plus big instrument building for HWO in the 2030's/2040's.

$\Longrightarrow$ Mid-career + junior cosmology faculty are needed at ASU to carry the HST/JWST Cosmology baton for the next 50 years.