Hubble WFPC2 imaging of the Ring Nebula:
an archival data mining project by the
Yerkes Astrophysics Academy for Young Scientists

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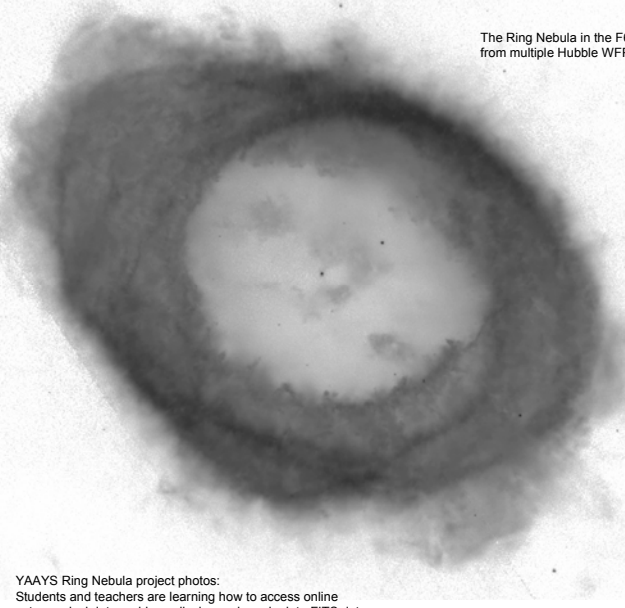
The newly-formed Yerkes Astrophysics Academy for Young Scientists (YAAYS) is an NSF-funded **collaboration of students, teachers, and scientists** at Yerkes Observatory. We have identified archival Hubble Space Telescope (HST) observations of the Ring Nebula (NGC 6720 or M57) for an initial exercise in the emerging field of astronomical **data mining** and curation. The multi-wavelength images of this object with the Wide Field Planetary Camera 2 (WFPC2) made it one of the best-studied planetary nebula, and it's sheer beauty as the **first Hubble Heritage release** in 1999 made it an instant Hubble icon.

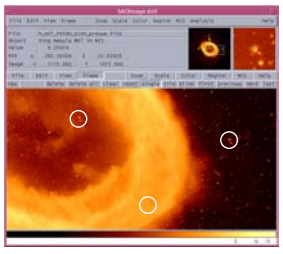


The Ring Nebula in the F658N filter, combining data from multiple Hubble WFPC2 observing programs

In recognition of this dataset's importance to both the study of planetary nebulae and the legacy of Hubble Space Telescope, we chose to prepare and **preserve it for posterity**. We have collected all available archival WFPC2 data, including some obtained subsequent to 1999, and are converting it into a fully and **expertly prepared scientific dataset**, using calibrations, methods, and software not available in the 1990s. Our treatment of this dataset will make it more immediately science-ready (and education-ready) than the standard archival products. Further, our prepared dataset will be ingested into the Hubble archive as a **High Level Science Product** (HLSP), making it queryable by future Hubble and NVO-type data searches. We present our prepared dataset **in honor of Bob O'Dell**, who has been a central figure in making the Hubble mission a reality, and in making many groundbreaking observations of nebulae with it -- including the Ring Nebula.

YAAYS Ring Nebula project photos:
Students and teachers are learning how to access online astronomical data archives, display and manipulate FITS data, and collaborate with scientists on image reduction and analysis

Students are measuring star positions to determine the shifts needed for image combination and cleaning



Our combined and prepared FITS data will be archived as High Level Science Products
http://archive.stsci.edu/prepds/heritage/