

# The Resolved Stellar Populations Early Release Science Program

Scientific Category: Stellar Populations

Scientific Keywords: Astrometry, Color-Magnitude Diagrams, Dwarf Galaxies, Local Group Galaxies, Star-Formation Histories

Instruments: NIRISS, NIRCAM

Proprietary Period: 0 months

Allocation Information (in hours):	Prime	Parallel
Science Time:	20.3	17.2
Charged Time:	27.2	

## Abstract

We propose to obtain deep multi-band NIRCAM and NIRISS imaging of three resolved stellar systems within 1 Mpc (NOI 104). We will use this broad science program to optimize observational setups and to develop data reduction techniques that will be common to JWST studies of resolved stellar populations. We will combine our expertise in HST resolved star studies with these observations to design, test, and release point spread function (PSF) fitting software specific to JWST. PSF photometry is at the heart of resolved stellar populations studies, but is not part of the standard JWST reduction pipeline.

Our program will establish JWST-optimized methodologies in six scientific areas: star formation histories, measurement of the sub-Solar mass stellar IMF, extinction maps, evolved stars, proper motions, and globular clusters, all of which will be common pursuits for JWST in the local Universe. Our observations of globular cluster M92, ultra-faint dwarf Draco II, and star-forming dwarf WLM, will be of high archival value for other science such as calibrating stellar evolution models, measuring properties of variable stars, and searching for metal-poor stars.

We will release the results of our program, including PSF fitting software, matched HST and JWST catalogs, clear documentation, and step-by-step tutorials (e.g., Jupyter notebooks) for data reduction and science application, to the community prior to the Cycle 2 Call for Proposals. We will host a workshop to help community members plan their Cycle 2 observations of resolved stars. Our program will provide blueprints for the community to efficiently reduce and analyze JWST observations of resolved stellar populations.

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## Investigators:

Investigator	Institution	Country
J Anderson	Space Telescope Science Institute	USA/MD
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A Cole	University of Tasmania	AUS
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K Sandstrom	University of California - San Diego	USA/CA
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Number of investigators: 11

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