

What is the Science Ready Data Products (SRDP) Initiative?

In the years leading up to the ngVLA, NRAO is improving the radio interferometry user experience for the VLA and ALMA. We are providing users with science quality data from both observatories and providing tools for data processing and discovery through a new archive interface. We aim to enable current ALMA and VLA users to focus more on science and less on data reduction. We also aim to broaden NRAO user community by reducing barriers (both expertise and computing infrastructure) to the use of radio interferometry data. This initiative is the pathfinder for producing science-ready data from the ngVLA.

Status: SRDP is currently in Pilot Operations with additional features added on an approximately yearly basis.

New NRAO Archive a prototype for ngVLA data interaction

Visit <https://archive-new.nrao.edu>

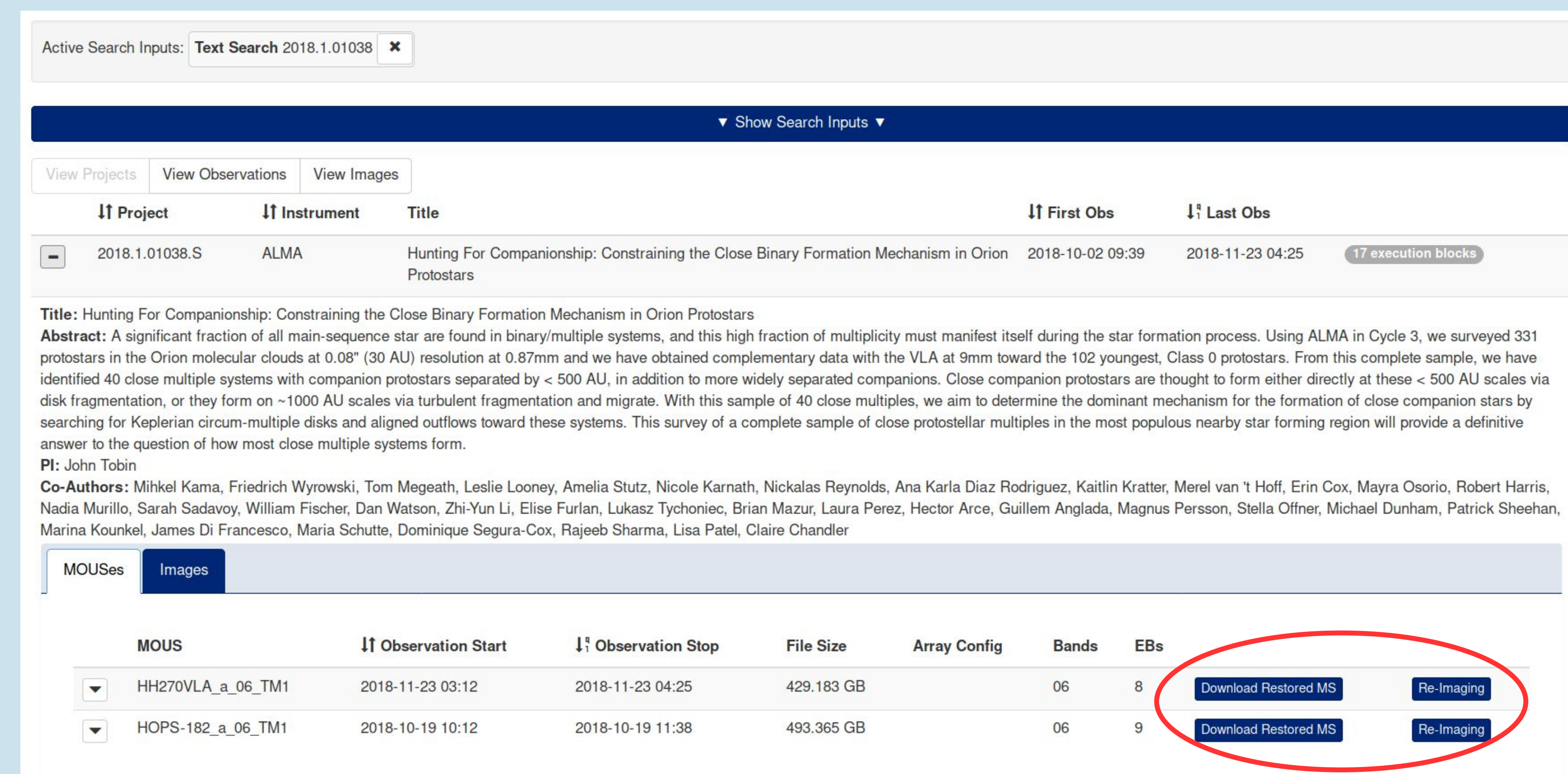
Current support model typically requires users to download visibility data and create images themselves and/or perform enhanced data reduction (e.g., self-calibration). ngVLA data volumes are expected to exceed the ability of individual users to process data themselves.

In the ngVLA era:

- Calibration pipelines will produce science-quality calibrations
- Quality Assurance (QA) process for all data
- Imaging pipelines will produce products specified by users
- Data products beyond those produced by default and as specified can be processed 'on-demand' using NRAO-provided computing infrastructure.

Current SRDP interface paves the way for this by providing:

- Calibrated ALMA and VLA data, restored on-demand using NRAO computing.
- Re-imaging capability for ALMA through archive, also using NRAO computing.
- Coming soon: Online data exploration using CARTA.



Active Search Inputs: Text Search 2018.1.01038

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Project	Instrument	Title	First Obs	Last Obs	Execution Blocks
2018.1.01038.S	ALMA	Hunting For Companionship: Constraining the Close Binary Formation Mechanism in Orion Protostars	2018-10-02 09:39	2018-11-23 04:25	17 execution blocks

Title: Hunting For Companionship: Constraining the Close Binary Formation Mechanism in Orion Protostars
Abstract: A significant fraction of all main-sequence stars are found in binary/multiple systems, and this high fraction of multiplicity must manifest itself during the star formation process. Using ALMA in Cycle 3, we surveyed 331 protostars in the Orion molecular clouds at 0.08" (30 AU) resolution at 0.87mm and we have obtained complementary data with the VLA at 9mm toward the 102 youngest, Class 0 protostars. From this complete sample, we have identified 40 close multiple systems with companion protostars separated by < 500 AU, in addition to more widely separated companions. Close companion protostars are thought to form either directly at these < 500 AU scales via disk fragmentation, or they form on ~1000 AU scales via turbulent fragmentation and migrate. With this sample of 40 close multiples, we aim to determine the dominant mechanism for the formation of close companion stars by searching for Keplerian circum-multiple disks and aligned outflows toward these systems. This survey of a complete sample of close protostellar multiples in the most populous nearby star forming region will provide a definitive answer to the question of how most close multiple systems form.
PI: John Tobin
Co-Authors: Mihkel Kama, Friedrich Wyrowski, Tom Megeath, Leslie Looney, Amelia Stutz, Nicole Karnath, Nickolas Reynolds, Ana Karla Diaz Rodriguez, Kaitlin Kratter, Merel van 't Hoff, Erin Cox, Mayra Osorio, Robert Harris, Nadia Murillo, Sarah Sadavoy, William Fischer, Dan Watson, Zhi-Yun Li, Elise Furlan, Lukasz Tychoniec, Brian Mazur, Laura Perez, Hector Arce, Guillem Anglada, Magnus Persson, Stella Offner, Michael Dunham, Patrick Sheehan, Marina Kounkel, James Di Francesco, Maria Schutte, Dominique Segura-Cox, Rajeeb Sharma, Lisa Patel, Claire Chandler

MOUSes Images

MOUS	Observation Start	Observation Stop	File Size	Array Config	Bands	EBs	Actions
HH270VLA_a_06_TM1	2018-11-23 03:12	2018-11-23 04:25	429.183 GB		06	8	Download Restored MS Re-Imaging
HOPS-182_a_06_TM1	2018-10-19 10:12	2018-10-19 11:38	493.365 GB		06	9	Download Restored MS Re-Imaging

VLA SRDP Quality Assured Calibrations

- Pilot operations performing QA on A & B-ranked projects, X-band and higher frequencies, observed with standard calibration strategies
- QA includes additional flagging and possible pipeline re-runs
- Calibrated and QAed data will be ready for science imaging
- QA process will help drive further pipeline improvements
- SRDP and VLASS QA process will form basis for ngVLA QA

ALMA Custom Cube Imaging

- Customizable:
 - frequency or velocity axes
 - rest frequency
 - channel width
 - cube width
 - angular resolution (future)
- On-demand ngVLA image processing will follow a similar framework

