The Design and Operation of the Keck Observatory Archive

https://koa.ipac.caltech.edu

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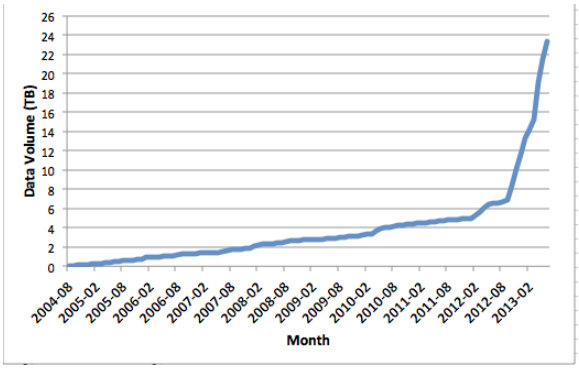
Keck Observatory Archive (KOA) Summary

- Operational since 2004.
- Hosts science and calibration data from seven active instruments with heterogenous metadata.
- Collaboration between NExScI/IPAC and WMKO.
- Leverages NExScI/IPAC archive heritage and expertise and WMKO observatory operations and instrumentation expertise.
- Creates and serves extracted and browse products.
- Archives newly acquired data and all previously acquired data for each instrument.
- Data transmitted electronically from WMKO to physical archive at NExScI.
- Implements a data access policy governing proprietary rights and public release of data.
- **A model for a TMT archive.**

Raw Data From All Active Instruments Will Be Archived In 2013

Instrument	PI Access	Public Access	Volume (TB)	# Files
OSIRIS	11/13 (est)	11/14 (est)	3.1	81,500
ESI	7/13	7/14	0.7	51,022
DEIMOS	3/13	4/14	8.2	90,050
MOSFIRE	1/13	1/14	0.9	54,164
LRIS	9/12	9/13	6.6	425,160
NIRC2	5/12	5/12	1.6	510,235
NIRSPEC	5/10	5/10	0.7	418,801
HIRES	7/04	7/06	4.8	330,715

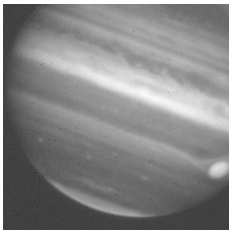


Data volume has grown rapidly as new instruments have been added.

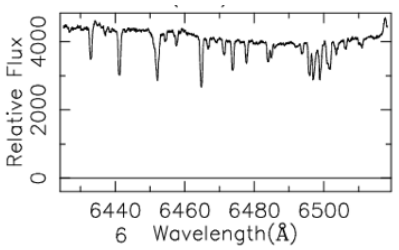
Extracted and Browse Products

KOA creates and serves extracted and calibrated products for HIRES and NIRC2.

Instrument	Volume (TB)	# Extracted or Calibrated Files
HIRES	3	49,186,799
NIRC2	0.44	308,454

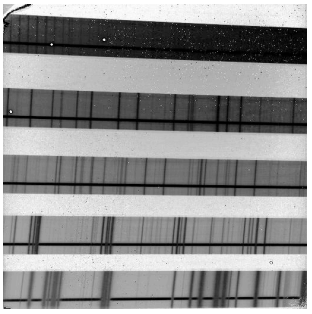


Many NIRC2 images are dark-subtracted and flat-fielded. Shown: Jupiter (PI: Graham).



KOA creates extracted HIRES browse spectra for every order of each object raw frame. Shown: T Tau. (PI: Reipurth).

KOA creates preview JPEGs for all raw science data.



Quicklook images, such as this spectrum from NIRSPEC, allow users to check the data content and quality. Shown: T Tau (PI: Mumma).

Implementation of Data Access Policy

- PIs are guaranteed proprietary access to their data for at least 18 months.
- Data become public as proprietary access period expires.
- Over half of the science and calibration files are public (~1 million).

Recent Science Results Using KOA

- *Masses and Distance of the Young Binary NTTS 045251+3016.* 2013. Simon et al. Ap J. accepted.
- Molybdenum, Ruthenium, And The Heavy R-process Elements In Moderately *Metal-poor Main-sequence Turnoff Stars* 2013. Peterson, Ap J 768, L13.
- *Absorbing gas around the WASP-12 planetary system.* 2013. Fossati et al. Ap J, 766, L20.

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