The Nearby Supernova Factory

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Automated Discovery and Observation of Nearby Supernovae

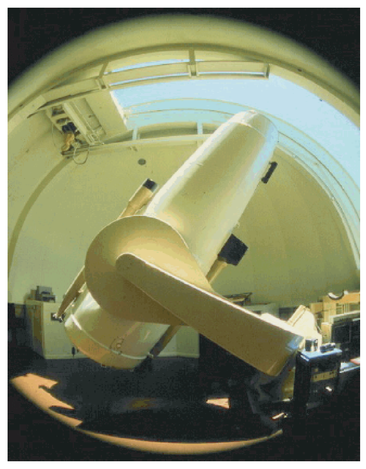
Goal: To find hundreds of nearby Type Ia supernovae to understand their intrinsic variation and improve the calibration of cosmology done with Type Ia SNe.

Searching

NEAT - Maui

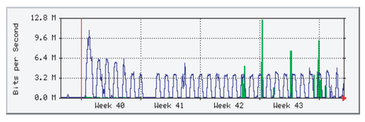
The camera for the MSSS 1.2m at Haleakala on Maui

NEAT - Palomar

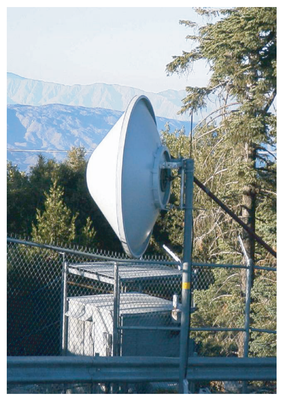


The retrofitted 48" Oschin telescope at Mt. Palomar Observatory

A wireless radio link is used to connect the Palomar telescope to the internet. We transfer up to 30 GB of compressed images through this link every night.



Nightly transfer rates



NEAT Search Facilities

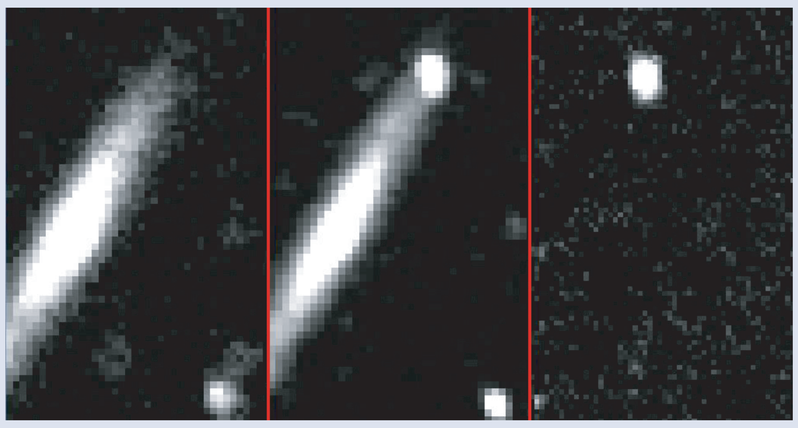
Site:	Haleakala	Palomar I	Palomar II
Aperture:	1.2m	1.2m	1.2m
Nights/Month:	18 dark/gray	18 dark/gray	9 dark/gray
Imager Format:	4k × 4k	3 × 4k × 4k	112 × 2.4k × 0.6k
Imager Scale:	1.33″/pixel	1.00″/pixel	0.50″/pixel
Field of View:	1.5°×1.5°	1.1°×3.4°	2.3°×4.0°
Filters:	open	open	4 fixed filters
Exposures:	3×20 sec	3×20 sec	TBD
Readout:	20 sec	20 sec	TBD
Nightly Coverage:	300□°	500□°	(1000 □°)
Start:	Mar 2000	Apr 2001	∼Jan 2002
Data (compressed):	12 Gbyte/night	40 Gbyte/night	(80 Gbyte/night)

Follow-Up Observations

YALO

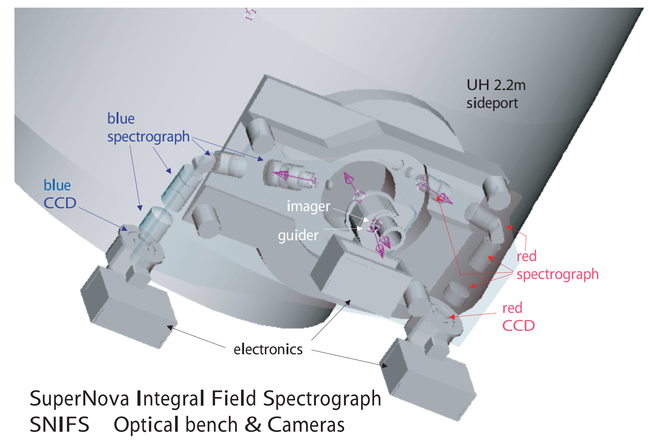
Hawaii 2.2m

Reference Image — Search Image = Subtraction



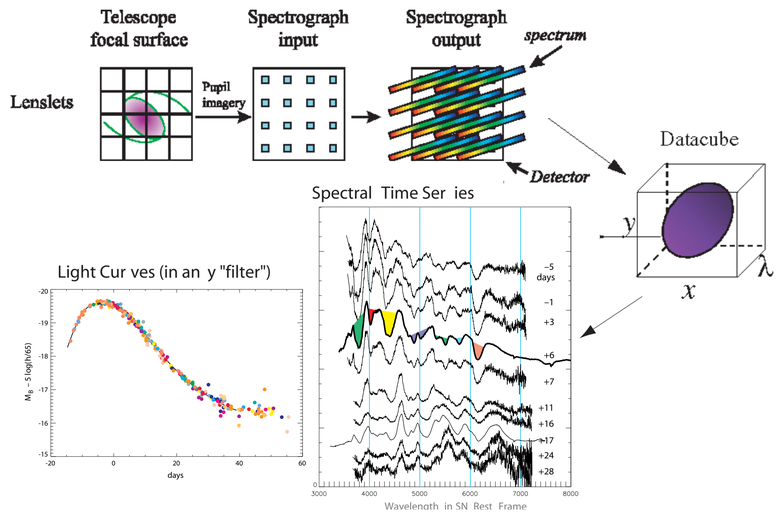
SN 2001dd

(Not originally discovered by us. Found when looking back through archived images after the IAUC announcement. This demonstrates the success of the automated data reduction and subtraction software.)



SuperNova Integral Field Spectrograph
SNIFS Optical bench & Cameras

The integral field unit spectrograph will allow photometric spectroscopic observation of both supernovae and their host galaxies.



SuperNova Integral Field Spectrograph Specifications

Integral Field Unit

Scale	0.4″/lens
Field of View	6″ × 6″

Spectrograph

Channel	Blue	Red
Coverage	3500–5500Å	5500–10000Å
Spectral Resolution	2.3Å	3.3Å
Grism	300 l/mm $\lambda_B = 4200$Å	300 l/mm $\lambda_B = 6500$Å
Detector	Marconi 2k × 4k	LBNL 2k × 4k
Calibration	He/Hg/Cd + flat	Ne/Ar/Xe + flat

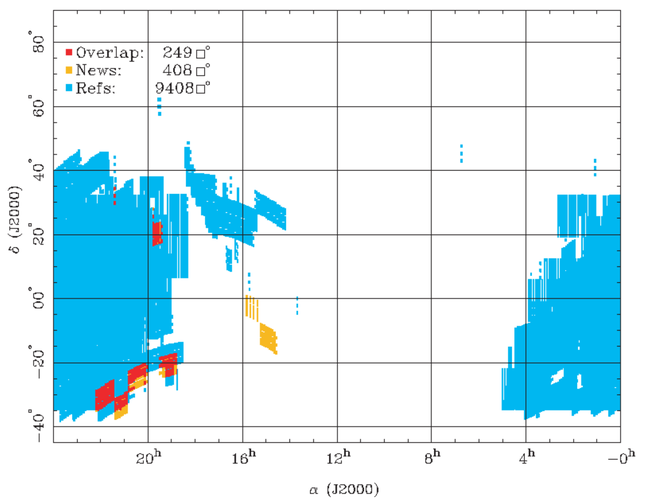
Auxiliary Camera

Scale	0.14″/pixel
Field of View	4.7′ × 9.4′
Detector	LBNL 2k × 4k
Filters	U,B,V,R,I,Z,extinction monitor

Guider/Focuser Camera (Fixed)

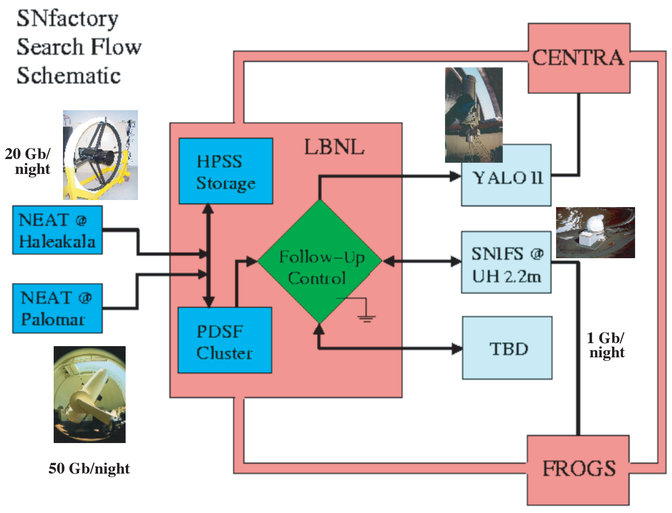
Scale	0.14″/pixel
Field of View	4.7′ × 9.4′
Detector	LBNL 2k × 4k
Filters	none

Sample Search Pattern



In full operation the SNfactory will cover hundreds of square degrees in a night.

Data Pipeline



Utilizing resources from a multitude of sites the data pipeline will automatically detect, confirm and make follow-up observations of nearby supernovae.

For more information pleace contact

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