# SEDM/SEDMV2 Status May 10, 2023

Don Neill

# Facility instrument on P60





# SEDM Team

- Josiah Purdum Operations
- Don Neill Instrument Scientist
- Christoffer Fremling Phot pipeline, ML classification
- Yashvi Sharma ML classification of spectra, operations analysis
- Jeff Zolkower Palomar Ops
- John Baker SEDM master
- Curt Corcoran Palomar
- Reed Riddle SEDMv2 software

- Mickael Rigault IFU pipeline
- Jesper Sollerman SEDM Czar
- Young-Lo Kim Contsep module, Cosmic Ray rejection
- Jeremy Lezmy HyperGal subtraction
- Yannick Copin IFU pipeline (author of Nearby Supernova Factory pipeline)
- Alex Reedy Andor Camera Software Integration

# SEDM Accomplishments On TNS (as of 05-06-2023)

- Leading classifier of SNe on TNS website
  - 4953 having SEDM as official classifier
  - 47% of all TNS classifications since ZTF start
  - 4 times next leading instrument
  - 5096 total classifications including supporting and non-SN
  - 4890 since ZTF start
- Averages 11 spectra every night
  - Averaged over all nights including cloudy and engineering
- Averages 8 ZTF spectra every night
  - SN spectral completeness @ r <= 18.5 > 90%

# SEDM Automatic ML Classification

- SNIascore implemented Nov 30, 2020
- SNIascore Fritz classification: Mar 9, 2021
- First TNS auto upload: Apr 14, 2021
  - SN2021ijb = ZTF21aastazz
- 1303 BTS SN have SNIascore > 0.9 (on TNS)
  - All but 1 has Fritz type of SNIa-norm
  - Exception: ZTF21aaplnxw SNIa -> SNIc pec
- Subtype classification in progress
- Aggregate with SNID and NGSF?

### Recent Instrument Events

- Apr 7, 2023 -- Andor upgrade
- Apr 7, 2023 -- Windows control computer replaced with linux computer
- Bad controller on chiller discovered
- Part ordered









CD Nonport . Keypad . SMC-RC

~

### +1.016388 DIS

Exec.

Original orientation wrong – pipeline not happy: Apr 6

### Flipped on both axes pipeline happy: Apr 7





made on 2023-04-06 at 18:04:17



2.6e+03

2.9e+03

3.3e+03

2e+03

2.3e+03

# Throughput Improvement







# Recent Telescope (P60) Events

- Fixed P60 Weather Station
  - New weather station integrated on Feb 2, 2023
- Open items:
  - Secondary re-design



Recent Software / Operations Events

#### Operations

- General robustification of robot
- Improved logging of robot
- Integrated Andor camera into robot
- Allow finer-grained fritz requests

#### Pipelines

- Integrate Andor camera (orientation)
- Integrate traces for Andor (ref epoch)
- Added automatic NGSF classification

# SEDMv2 Project Status

D. Neill

Y. Sharma

J. Fucik

L. Fahey

R. Riddle

M. Rigault

J. Purdum

A. Reedy

### **Current** Status Overview



Installed on 2.1m !

Tri-Prism Installed Electronics panel installed Software testing ongoing Cooling lines purged Budget: Funded through private donation + partnership

Now have KP84 until 2025!!

Four Partners with Caltech/ZTF:

- Goddard/U Maryland
- U Minnesota
- Northwestern
- STScI



#### Commissioning nearly complete!

See following talk: Y. Sharma for details

# First Collab Meeting: Oct 18, 2022

- Fabrication Team
  - Instrument Overview
  - Installation progress
  - Commissioning Status
- Collaboration:
  - Caltech, UMinn, JSI (Goddard/Umaryland), Nothwestern, STScI
  - Better, stronger together
  - Divers set of projects
  - BTS can push deeper
- Collaboration Tools
  - Duty Astronomer
  - Slack channel
  - Allocation tracking
- Yearly meeting

### Big Picture "no mean plans"

- World domination!
- Robotic follow-up for ZTF-II, LSST, all time-domain!
- With KP84+ could achieve 100% completeness down to 19+ mag
- Win by focusing on classification:
  - Low resolution -> high throughput
    -> many classifications
- Infrastructure and coordination are important: Web/DB
- Future SEDMs: southern/eastern hemispheres?



### Acknowledgements & Web pages

- Please cite:
  - Blagorodnova, Neill, Walters et al. 2018 (SEDM instrument)
  - Rigault, Neill, Blagorodnova et al. 2019 (*pysedm* pipeline)
- Acknowledge:
  - SED Machine is based upon work supported by the National Science Foundation under Grant No. 1106171

#### • SEDM Status:

- minar.caltech.edu/monitor
- Documentation:
  - www.astro.caltech.edu/sedm
  - www.astro.caltech.edu/sedmkp (draft form)
- Data access:
  - minar.caltech.edu
  - Account required (jpurdum@caltech.edu)
- Twiki:
  - <u>http://www.oir.caltech.edu/twiki\_ptf/bin/view/ZTF/SEDMOperat\_ions</u>
- Nightly report emailed to tda@lists.astro.caltech.edu