

## IGRINS Newsletter -- 2017 Trimester 1

Dear IGRINS community:

Our IGRINS deployment to the Discovery Channel Telescope (DCT) has been very successful. After a brief commissioning period in September 2016, IGRINS has been scheduled on 61 nights in 2016Q4 and 47 nights in 2017Q1. We are still accepting queue requests for DCT observations and more information is included in this newsletter.

In March 2017 IGRINS will return to McDonald Observatory, where improvements made to IGRINS for the DCT will be commissioned. We will then offer an IGRINS mini-queue from March 10<sup>th</sup> to 16<sup>th</sup>, 2017. Requests for this mini-queue time are due by March 5<sup>th</sup>, 2017. IGRINS will be offered at McDonald for all of Trimester 2 (April-July) before returning to the DCT in late-August 2017.

IGRINS was well represented at the winter AAS meeting in Grapevine, Texas. Kyle Kaplan gave his dissertation talk on IGRINS emission spectra, Lisa Prato presented IGRINS successes at the DCT, Rob Robinson and Cynthia Froning presented a poster on their observations of SS433, Andrew Mann gave a talk on the ZEIT survey, Brendan Bowler presented his detection of an extremely red L dwarf, and George Jacoby included IGRINS in his summaries of DCT instrumentation. The summer AAS meeting will be held in Austin and we plan to see a strong IGRINS representation there as well.

There are now more than a dozen IGRINS papers published with over 35 citations, and another half dozen papers submitted. With IGRINS' diverse telescope access and broadening user community, we hope that the collaborations can continue to grow and that 2017 is the biggest year for IGRINS science so far!

With best wishes,  
Dan Jaffe and the IGRINS Team

## **1. No Newsletter was sent in Trimester 3 of 2016.**

## **2. Current IGRINS Status and Performance**

A number of changes were made to IGRINS when it was commissioned at the DCT. Specific to the DCT, IGRINS has a new instrument mount and three lens fore-optic assembly that converts the DCT  $f/6.1$  beam to the  $f/8.8$  input that IGRINS was designed for. Jae-Joon Lee also made important software adjustments that stabilize the IGRINS-to-telescope communications. IGRINS gained a glycol-cooled electronics rack too. Additional baffling around the cryogenic slit mask has further reduced the K band light leak. Documentation and procedural notes are an ongoing challenge that we hope to make progress on in the coming months. When IGRINS returns to McDonald in March 2017 we will be permanently installing the instrument cooling system, including a new glycol chiller for the helium compressor.

## **3. IGRINS Performance at the DCT**

Typical observations with IGRINS on DCT are ABBA nod sets with 300 second exposures. For a  $K=10$  target, this provides a peak signal-to-noise of  $\sim 150$ . The bright limit for IGRINS on DCT is  $K=4$ , and typical targets should be fainter than  $K=8$  to keep exposure times greater than pointing and acquisition overheads. The faint limit for IGRINS is  $K\sim 13$ , depending on the observing conditions and the desired signal, with 2 hours of exposure time providing signal-to-noise  $\sim 90$  at this limit. The DCT facility guider is not able to reach focus when used with IGRINS. As such, IGRINS users should expect to do any guiding with the IGRINS slit-viewing camera. The IGRINS slit on the DCT is  $\sim 0.63$  arcseconds wide and  $\sim 9.42$  arcseconds long. Blind offsets to a target from a star on the IGRINS slit-viewing camera are feasible, but require patience and planning.

## **4. IGRINS at DCT Queue Requests - through February 2017**

We anticipate  $\sim 6$  more queue nights for UT and KASI astronomers before IGRINS leaves the DCT at the end of February. Science requests by UT and KASI astronomers are welcome at this link, <https://goo.gl/forms/QwlhdlPYfuMzOXG02>

The KASI Legacy and UT YSO guaranteed programs for IGRINS will have a similar number of nights and will not request queue time. We continue to encourage collaboration with these programs rather than requesting separate observations of the same sources. Please contact these groups if you would like to collaborate.

## **5. IGRINS at McDonald - March through August 2017**

When IGRINS returns to McDonald Observatory in March we will have a weeklong mini-queue. Observations still on the DCT queue will be rolled over into the McDonald queue. New requests were solicited along with the Trimester 2 call for proposals and can be submitted using this form by March 5<sup>th</sup>, 2017: <https://goo.gl/forms/QwlhdlPYfuMzOXG02>.

Classical observing with IGRINS at McDonald in Trimester 2 (April-July) will be limited to 30 nights of TAC awarded time, of which about half will be supported by the IGRINS Team. Guaranteed time for KASI Legacy and UT YSO programs will share 20 additional nights.

#### **6. IGRINS at DCT - Late-August 2017 through January 2018**

Rather than bringing IGRINS back to UT for its annual maintenance in August, it will go back to DCT for another visit. This is possible because the greatest risk to IGRINS, a cooling system failure, is greatly reduced with the permanent cooling setup at McDonald and the instrument cube installation at the DCT. In this second visit to the DCT we will offer both classical and queue observing to the UT and KASI communities. Classical requests must be for at least 3 nights and the observer has to have used IGRINS alone at McDonald or the DCT. A call for proposals will be made along with the McDonald Trimester 3 solicitation, due on May 31, 2017.

#### **6. IGRINS at the European Week of Astronomy and Space Science 2017**

Gregory Mace will present an invited talk on IGRINS at the EWASS meeting in Prague between June 26-30<sup>th</sup>, 2017. Matteo Brogie, collaborating with UT graduate student Jessica Luna on exoplanet atmosphere detections with IGRINS, is also an invited speaker. We have the opportunity to emphasize IGRINS capabilities to the European community and encourage people who will attend this meeting to submit their contributed talks to the same special session on NIR High-Resolution Spectroscopy (<http://eas.unige.ch/EWASS2017/session.jsp?id=SS7>).

#### **7. IGRINS Pipeline Package Versions**

We have switched IGRINS from an internal calibration unit to dome flats and skyline only wavelength solutions. This means that observations from the first 2 years at McDonald should use 'v2.1-alpha.3' of the plp, while observations using dome flats will use an update to the plp. (<https://github.com/igrins/plp>)

#### **ADS Listed IGRINS Science Papers:**

Afşar, Melike, et al., **The Chemical Compositions of Very Metal-Poor Stars HD 122563 and HD 140283; A View From the Infrared**, 2016, ApJ, 819, 103

Bowler, Brendan, et al., **Planets Around Low-Mass Stars (PALMS). VI. Discovery of a Remarkably Red Planetary-Mass Companion to the AB Dor Moving Group Candidate 2MASS J22362452+4751425**, 2016, arXiv:1611.00364

Gaidos, Eric, et al., **Zodiacal Exoplanets in Time (ZEIT) II. A "Super-Earth" Orbiting a Young K Dwarf in the Pleiades Neighborhood**, 2017, MNRAS, 464, 850

Gullikson, Kevin, et al., **The Close Companion Mass-ratio Distribution of Intermediate-mass Stars**, 2016, AJ, 152, 40

- Gullikson, Kevin, et al., **Direct Spectroscopic Detection: An Efficient Method to Detect and Characterize Binary Systems**, 2016, *AJ*, 151, 3
- Herczeg, Gregory, et al., **The Eruption of the Candidate Young Star ASASSN-15QI**, 2016, *ApJ*, 831, 133
- Johns-Krull, Christopher, et al., **A Candidate Young Massive Planet in Orbit around the Classical T Tauri Star CI Tau**, 2016, *ApJ*, 826, 206
- Le, Huynh Anh, et al., **Fluorescent H<sub>2</sub> Emission Lines from the Reflection Nebula NGC 7023 Observed with IGRINS**, 2016, arXiv:1609.01818
- Lee, Jeong-Eun, et al., **High Resolution Optical and NIR Spectra of HBC 722**, 2015, *ApJ*, 807, 84
- Lee, Seokho, et al., **IGRINS Spectroscopy of Class I sources: IRAS 03445+3243 and IRAS 04239\_2436**, 2016, *ApJ*, 826, 179
- Mann, Andrew, et al., **Zodiacal Exoplanets in Time (ZEIT) IV: seven transiting planets in the Praesepe cluster**, 2016, arXiv:1609.00726
- Mann, Andrew, et al., **Zodiacal Exoplanets in Time (ZEIT) III: A Neptune-sized planet orbiting a pre-main-sequence star in the Upper Scorpius OB Association**, 2016, *AJ*, 152, 61
- Mann, Andrew, et al., **Zodiacal Exoplanets In Time (ZEIT) I: A Neptune-sized planet orbiting an M4.5 dwarf in the Hyades Star Cluster**, 2016, *ApJ*, 818, 46
- Oh, Heeyoung, et al., **Three-dimensional Shock Structure of Orion KL Outflow with IGRINS**, 2016, arXiv:1610.09459
- Oh, Heeyoung, et al., **IGRINS Near-IR High-Resolution Spectroscopy of Multiple Jets around LkHa 234**, 2016, *ApJ*, 817, 148
- Sterling, Nicholas, et al., **Discovery of Rubidium, Cadmium, and Germanium Emission Lines in the Near-Infrared Spectra of Planetary Nebulae**, 2016, *ApJL*, 819, L9