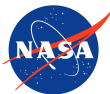




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UCLab  
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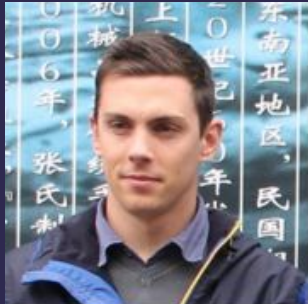
KILONOVA CATCHER

# Telecon: Wednesday, June 25th

## Presented by The Kilonova Catcher Core Team

# Welcome & Introductions

**PI: Damien Turpin**



**Astrophysicist**

**at CEA-Saclay Paris**

**damien.turpin@cea.fr**

**GRANDMA PI: Sarah Antier**



**Astronomer**

**at OCA-Nice and  
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**Astrophysicist -**

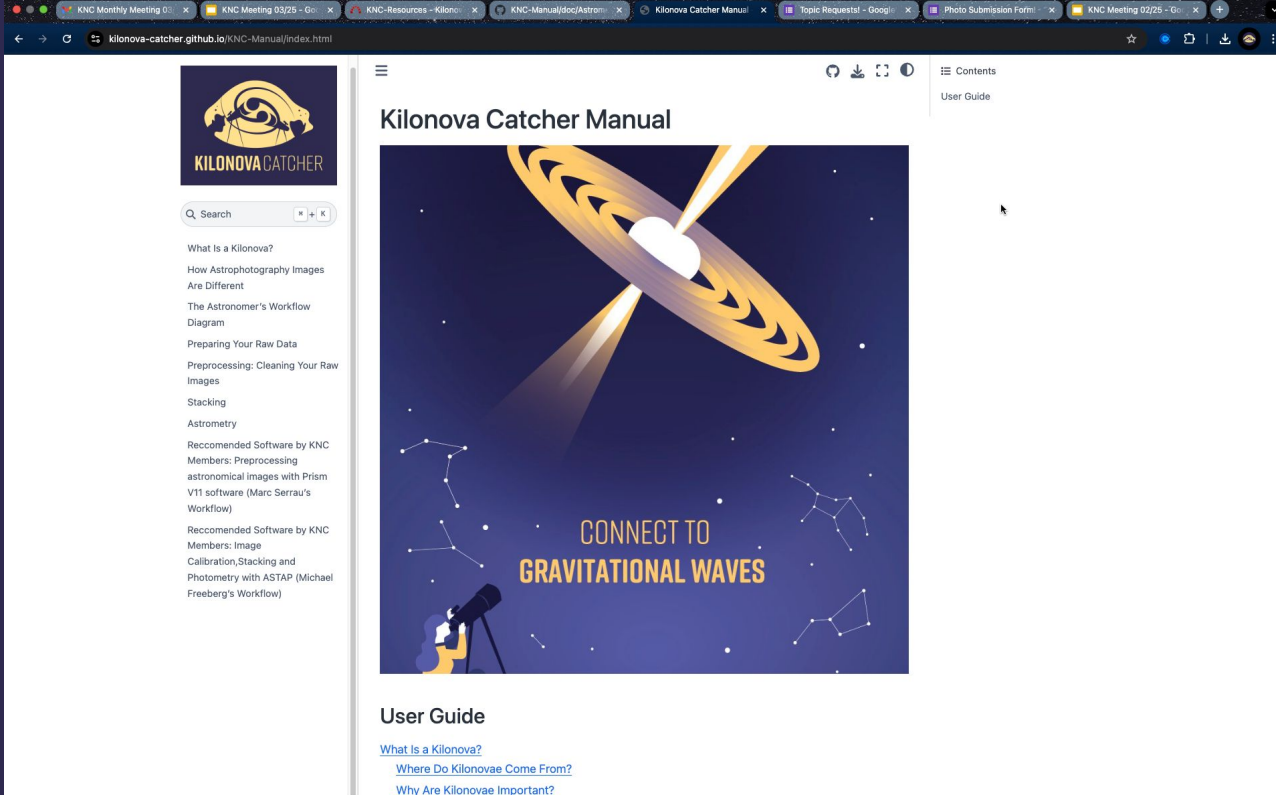
**Research Professional**

**University of Minnesota  
- USA**

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Manual: <https://kilonova-catcher.github.io/KNC-Manual/index.html>



The screenshot shows the Kilonova Catcher Manual website. The browser's address bar displays the URL `kilonova-catcher.github.io/KNC-Manual/index.html`. The website features a dark blue header with the Kilonova Catcher logo on the left and a navigation menu on the right containing 'Contents' and 'User Guide'. The main content area has a large illustration of a gravitational well with the text 'CONNECT TO GRAVITATIONAL WAVES'. A left sidebar lists various topics for exploration, including 'What Is a Kilonova?', 'How Astrophotography Images Are Different', 'The Astronomer's Workflow Diagram', 'Preparing Your Raw Data', 'Preprocessing: Cleaning Your Raw Images', 'Stacking', 'Astrometry', 'Recommended Software by KNC Members: Preprocessing astronomical images with Prism V11 software (Marc Serrau's Workflow)', and 'Recommended Software by KNC Members: Image Calibration, Stacking and Photometry with ASTAP (Michael Freeberg's Workflow)'. Below the main illustration, the 'User Guide' section is visible, with links to 'What is a Kilonova?', 'Where Do Kilonovae Come From?', and 'Why Are Kilonovae Important?'.

Kilonova Catcher Manual

CONNECT TO GRAVITATIONAL WAVES

User Guide

[What is a Kilonova?](#)

[Where Do Kilonovae Come From?](#)

[Why Are Kilonovae Important?](#)



# Agenda



1. Rubin Observatory First Look Images (Presentation)
2. GRANDMA updates
3. Circular Template
4. Circular release protocol
5. Mid year feedback
6. Alert system
7. Release of user quote form for website and posts
8. Open Discussion?

*Please let me know if  
I am not sharing my  
screen!*



# Rubin Observatory First Look Images (Presentation)



# GRB Follow Up – Based on associated GCN event pages.

The current consensus of the GRB group is to start observing events that are well-localized AND pass one of the following criteria:

## 1. Short Duration + High Energy

We look for GRBs shorter than:

2 seconds if reported by Fermi, SVOM/GRM, MAXI, or ARGILE

--> in at least one band AND the upper energy band is  $> 100$  keV

3 seconds if reported by Swift

--> If it's borderline (e.g. 2.9s), ask the group to discuss.

Why?

These are likely short GRBs, which are candidates for kilonova counterparts or gravitational wave events.

## 2. Very High Energy Detection

GRBs with LAT counterparts (Fermi-LAT detections in the  $\sim 10$ – $100$  GeV range)

Why?

These are highly energetic bursts, often long GRBs, and valuable for afterglow and host galaxy studies even without a redshift yet.

## 3. Redshift Identified (Spectroscopic or Photometric)

If redshift is known within a day, consider follow-up for:

Low- $z$  ( $z < 1$ ): nearby = brighter afterglow = possible host identification

High- $z$  ( $z > 4$ ): rare and scientifically valuable (early universe studies)

Why?

These provide context—either very nearby (good for kilonova) or very distant (good for studying early galaxies).



# Circular Templates

## To be discussed...GCN Release Protocol.

GRB YYMMDDX: *Kilonova-Catcher optical upper limits / Kilonova-Catcher optical afterglow detection*

KNC\_author1, KNC\_author2, etc. (KNC), D. Turpin (CEA-Saclay/Irfu), C. Andrade(UMN), M. Pillas (ULiege), M. Tanasan (NARIT), S. Antier (OCA/IJCLAB) on behalf of the GRANDMA/Kilonova-Catcher collaboration:

We observed the field of GRB YYMMDDX (GCN\_author et al., GCN number) detected by trigger\_instrument with the GRANDMA citizen science project Kilonova-catcher (KNC). Our observations were performed with the KNC\_tel\_name1 telescope operated by KNC\_author1 and a KNC\_tel\_name2 telescope located at KNC\_observatory\_name2 Observatory operated by KNC\_author2, etc.. Our observations started at TGRB+XXhr.

In our stacked frames, subtracted from the PanSTARRS DR2 template image, *we do not detect any optical counterpart / we detect the optical counterpart* inside the external\_x-ray\_telescope\_team\_name1 refined / position (GCN\_author et al., GCN GCN number). *ONLY IF DETECTION otherwise no sentence -> This position is consistent with the afterglow candidate reported by* external\_opt\_telescope\_team\_name1 (GCN\_author et al., GCN GCN number), external\_opt\_telescope\_team\_name2 (GCN\_author et al., GCN GCN number), etc.

We report our follow-up results in the table below (*do not care too much about the table layout, you will have to redo the layout in the GCN website in the submit form*):

Tmid-TGRB (hr)	Exp (s)	Filter	Magnitude	Instrument
7.9	6 x 300s	r (AB)	20.1 (U.L., <u>XX</u> sigma)	TEC160FL
8.1	11 x 300s	g (AB)	20.8 +/- 0.1	CDK17-AITP

All the data have been reduced by a single data processing pipeline, STDPipe (Karpov et al., 2022). Images obtained with the sloan filters were calibrated using the PanSTARRS DR1 catalog. Images obtained with the Johnson-cousins filters were calibrated using the GAIA DR3 synphot catalog. Images obtained with the gaia filters were calibrated using the GAIA DR3 catalog.

We use the SkyPortal application (skyportal.io) to monitor our observational campaign (Coughlin et al. 2023).

GRANDMA is a worldwide telescope network (grandma.ijclab.in2p3.fr) devoted to the observation of transients in the context of multi-messenger astrophysics (Antier et al. 2020 MNRAS 497, 5518). Kilonova-Catcher (KNC) is the citizen science program of GRANDMA (<http://kilonovacatcher.in2p3.fr/>).

Legend:

*Blue text: must be modified by the authors*



# Mid Year Feedback Form

First Name, Last Name, and slack username. \*

Your answer

How many images have you submitted this last year? Since you joined? \*

Your answer

How much do you plan to contribute over the next year? \*

- ☐ As many as observation as the weather gods allow.
- ☐ More than half
- ☐ Less than half
- ☐ Only for very interesting events
- ☐ Other: \_\_\_\_\_

We're always looking for ways to help our members feel more empowered to contribute. Are there any skills you're interested in building, or anything KNC could do to better support your involvement? \*

Your answer

Other Comments? Questions? Compliments? Concerns? \*

Your answer

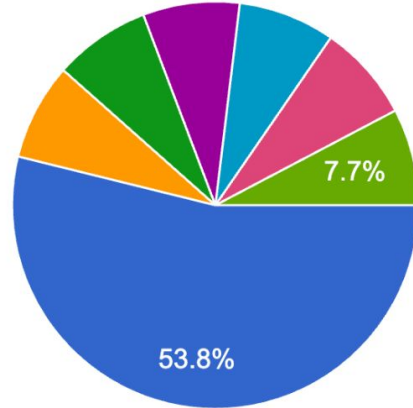
Please continue to  
respond!





# Mid Year Feedback Form - Contribution

13 responses



- As many as observation as the weather gods allow.
- More than half
- Less than half
- Only for very interesting events
- I am around 1 week a month near my telescope closed to New Moon to sch...
- 200 good nights per year in Chili but o...
- When I have the opportunity to use a...
- As many as the weather and the objec...

# Mid Year Feedback Form

We're always looking for ways to help our members feel more empowered to contribute. Are there any skills you're interested in building, or anything KNC could do to better support your involvement?

## Technical Skills

Estimate SNR based on filters, exposure, and target brightness

✓ Learn stpipe pipeline for photometry

⚠ Improve target localization and coordinate accuracy (ongoing as GRANDMA observes with KNC)

Use tools for measuring magnitudes independently

⚠ Clarify terms like "square location in square degrees"

## Image Analysis

⚠ Example image analysis walkthroughs

⚠ Help with image stacking and test observations

⚠ Understand image subtraction and error estimation

Learn photometry procedures and software

## Community Resources

Activate KNC repository quickly after alerts

⚠ Create FAQ page with member-submitted answers

⚠ Host workshops on data analysis and processing

✓ Offer feedback on uploaded images and scientific use (Partially with GCN)

## Support & Access

Help reconnecting to Slack

✓ Match members for one-on-one guidance

✓ Provide opportunities during LIGO downtime



# Mid Year Feedback Form



Other Comments? Questions? Compliments? Concerns?

## Technical Skills

"KNC is a great working group – exciting topics even when targets are elusive."

"Very enjoyable working with GRANDMA and KNC teams."

"Monthly meetings are engaging—Cristina does an excellent job enriching KNC!"

"Thanks for all the time and effort invested in KNC."

"Appreciate how much work goes into the meetings and coordination."

## Suggestions & Requests

Organize an observatory-based training session

Resume transient observing during downtime (like 03–04)

Include RAPAS filters in KNC pipeline

Provide a way to find past participation records (e.g., GRB221009A)

## Participation & Plans

Some members are upgrading their setups!

Others are temporarily offline due to equipment issues

Members often find creative ways to contribute data, even remotely when personal tools aren't accessible.

## Looking Forward

Hope to meet KNC/GRANDMA team in person someday

Excited by recent alerts and eager to re-engage



# Social Media and Users


I will be reaching out to you all to hear about your individual experiences as astronomers!  
Coming soon!

# Forms: Topic Requests!

This form will help the KNC Core Team:

- pick our guest speakers
- organize Q&A sessions
- Webinars
- Write and collect resources and videos
- Photo challenge topics

**Please do not be afraid to submit! Over and over!**



## Topic Requests!

**B** *I* U [↻](#) [✕](#)

Is there a topic, specific or general, you would like to see presented on or discussed? Any topics for Q&A session? Breakout session? Topics for Photo Challenges?

**1 Topic per Submission. Feel free to submit several times.**

Email \*

Valid email

This form is collecting emails. [Change settings](#)

**Name**

Short answer text

**What topic would you like to see discussed or presented?**


Long answer text

# Forms: Photo Submission!

**Submit in the same spot!**



**Photo of the Week!** Please submit any and all images you want to share!

What is the date your are submitting? \*

Month, day, year 

Upload Image(s) here. If you have several images of the same target that you would like to submit, please include them.

No more than 5, please.

 Add file  View folder

Description of the image!

**Some Ideas:**

What was the night like when you were observing?

What were the settings used to capture this image?

What made you decide to observe this object?

What was the date & time this object was observed?

Etc....

Long answer text

Do you consent to this photo being posted to Kilonova Catcher social media and/or website?

We will give credit using your name.

☐ Yes

☐ No



# Social Media

## How to Join & Contribute

**Instagram:** @kilonovacatcher

**Threads:** @kilonovacatcher

**Twitter:** @KilonovaCatcher

**Facebook Page:** ???

*Please follow  
and support!*

# KNC Social Calendar

KNC Social Calendar currently:

- Monthly Meeting
- Monthly Webinars
- Cristina's public talks (when available)

It currently has the zoom link to connect there.

Send me an email or slack message if there is an event related to KNC activity that you think others may be interested in!



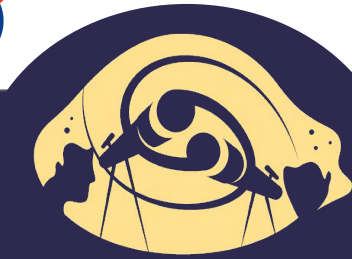




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# Thank you! Open Discussion?