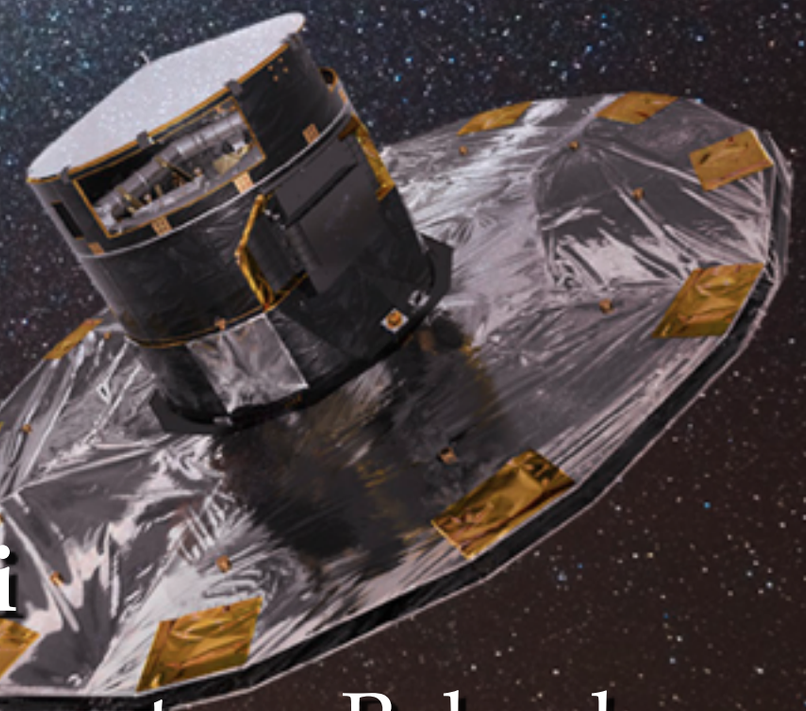
TIME DOMAIN ASTRONOMY

FP7/WP11

2012-2016



Łukasz Wyrzykowski

Warsaw University Astronomical Observatory, Poland

Gaia Alerts Workshop, Utrecht, 8th December 2016

PEOPLE 2013-2016

Warsaw University

Dr hab. Łukasz Wyrzykowski

Dr Krzysztof Ulaczyk (part-time PDRA) - observations (Warsaw, Loiano), data reductions, automatization, calibrations, technical support to the observatories in the network.

Dr Zuzanna Kostrzewa-Rutkowska - visualisations, data analysis, data maintanance

Michał Pawlak (PhD stud)- observations (Warsaw, Loiano, OHP, LCOGT), data reductions

undegraduate students from Warsaw - observations in Warsaw and Loiano

Liverpool John Moores University

Prof. Iain Steele

Dr Robert Barnsley (PDRA) - generic pipeline for spectroscopic time domain data via web browser for professional and amateur astronomers.

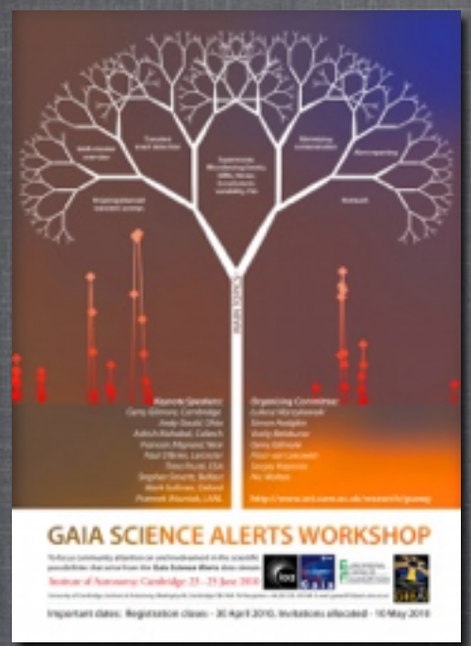
Mr Andrzej Piascik (PhD student) - designing and building of SPRAT spectrograph for LT and possibly other telescopes

ACHIEVEMENTS

- network of small telescopes (~20 active)
- automated system for crude photometric data reductions
- central repository of follow-up data (>30000 observations)
- developed efficient and low cost spectrograph SPRAT (Liverpool)
- 4 workshop to connect observers to science (Gaia Alerts-related)
- your lunches in Utrecht :)

GAIA SCIENCE ALERTS WORKSHOPS

2010-Cambridge



2011-Cambridge

2012-Bologna

2013-Paris

2014-Warsaw

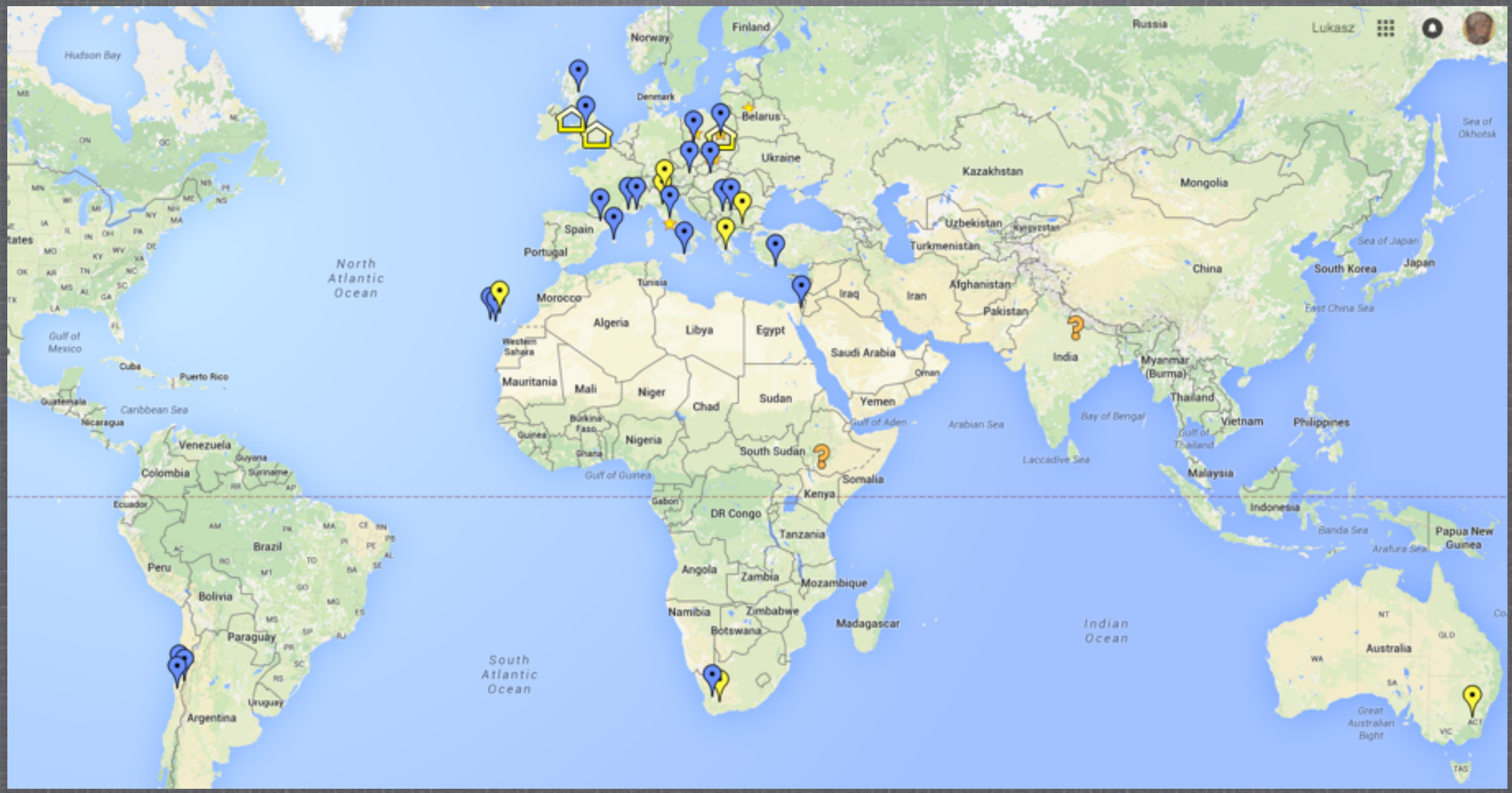
2015-Liverpool

2016-Utrecht

Archive of slides and videos:
http://www.ast.cam.ac.uk/ioa/wikis/gsawgwiki

OPTICON FOLLOW-UP NETWORK

~20 active partners, ~30000 data points collected 2014-2016



OPTICON FOLLOW-UP NETWORK

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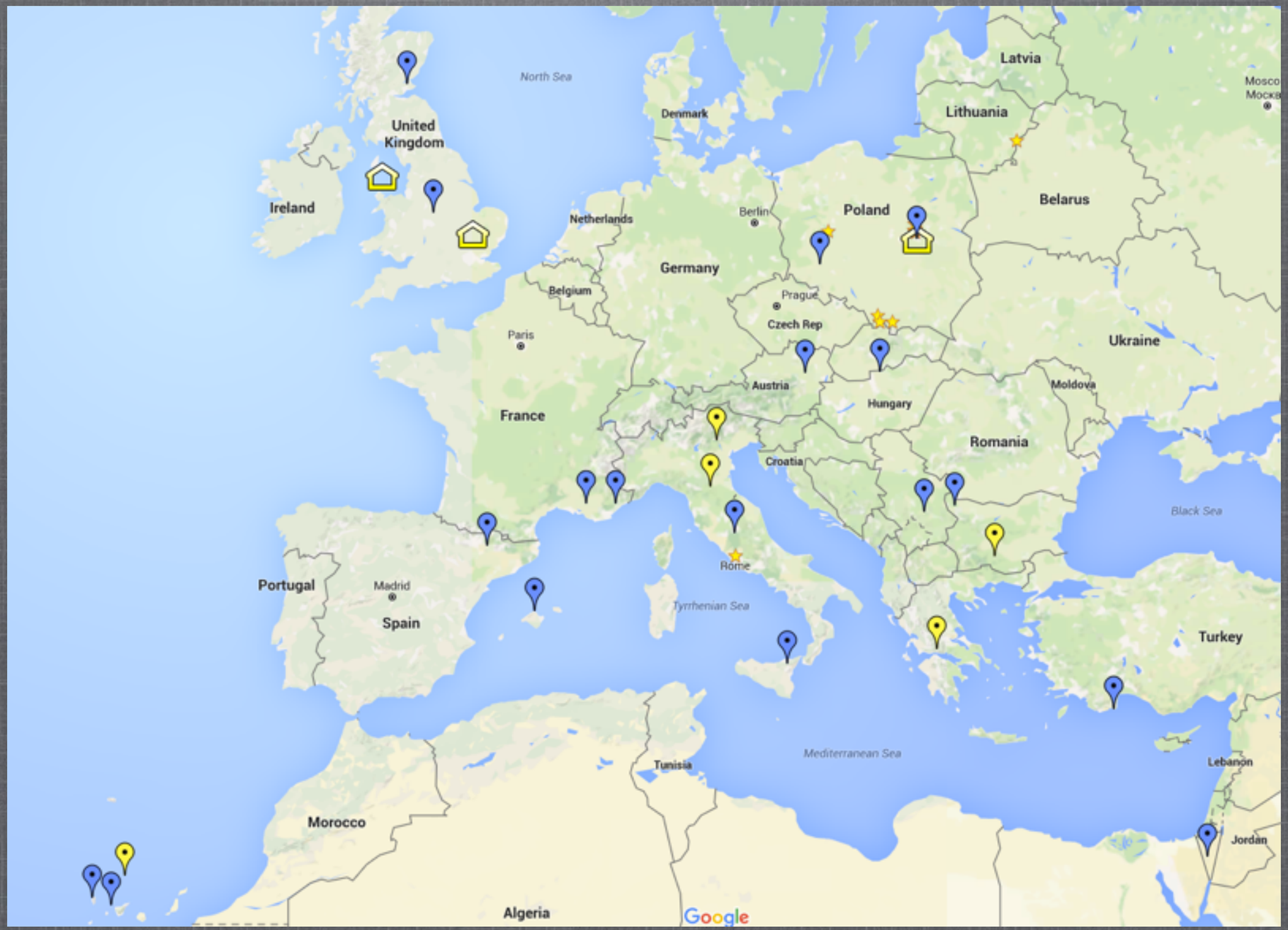
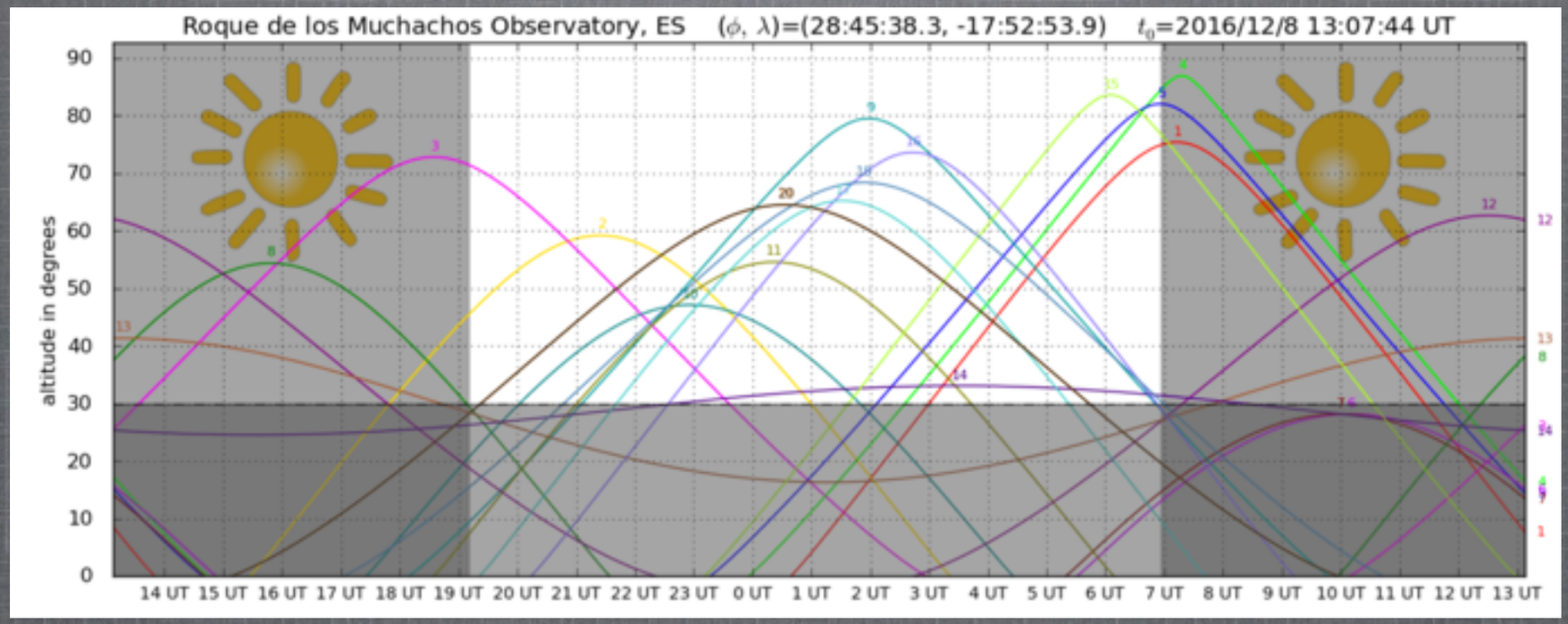
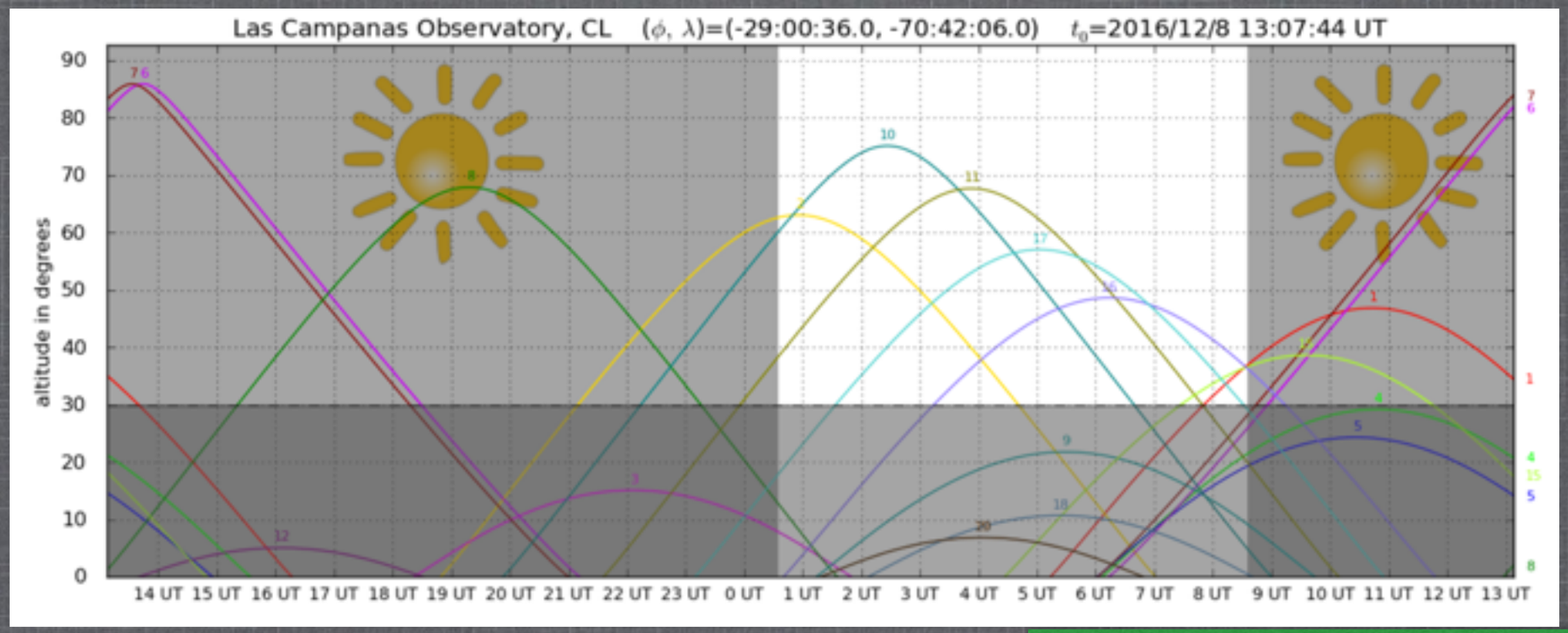


OBSERVATION PLANNING TOOL

www.astrouw.edu.pl/~kulaczyk/ephem





designed by Krzysztof Ulaczyk and LW

FOLLOW-UP CALIBRATION SERVER

gsaweb.ast.cam.ac.uk/followup/

Welcome to the Cambridge Photometry Calibration Server (CPCS)

Logged as admin

Login into the system
List of alerts (observed only)
List of followup data
List of observatories
Upload new followup data
Enter new event
Delete a followup point from the system

Admin stuff

Add a new user into the system
Update the coordinates of an alert

Last data upload was done on Thu Aug 14 15:47:16 2014 for ivo://asassn/ASASSN-14bb

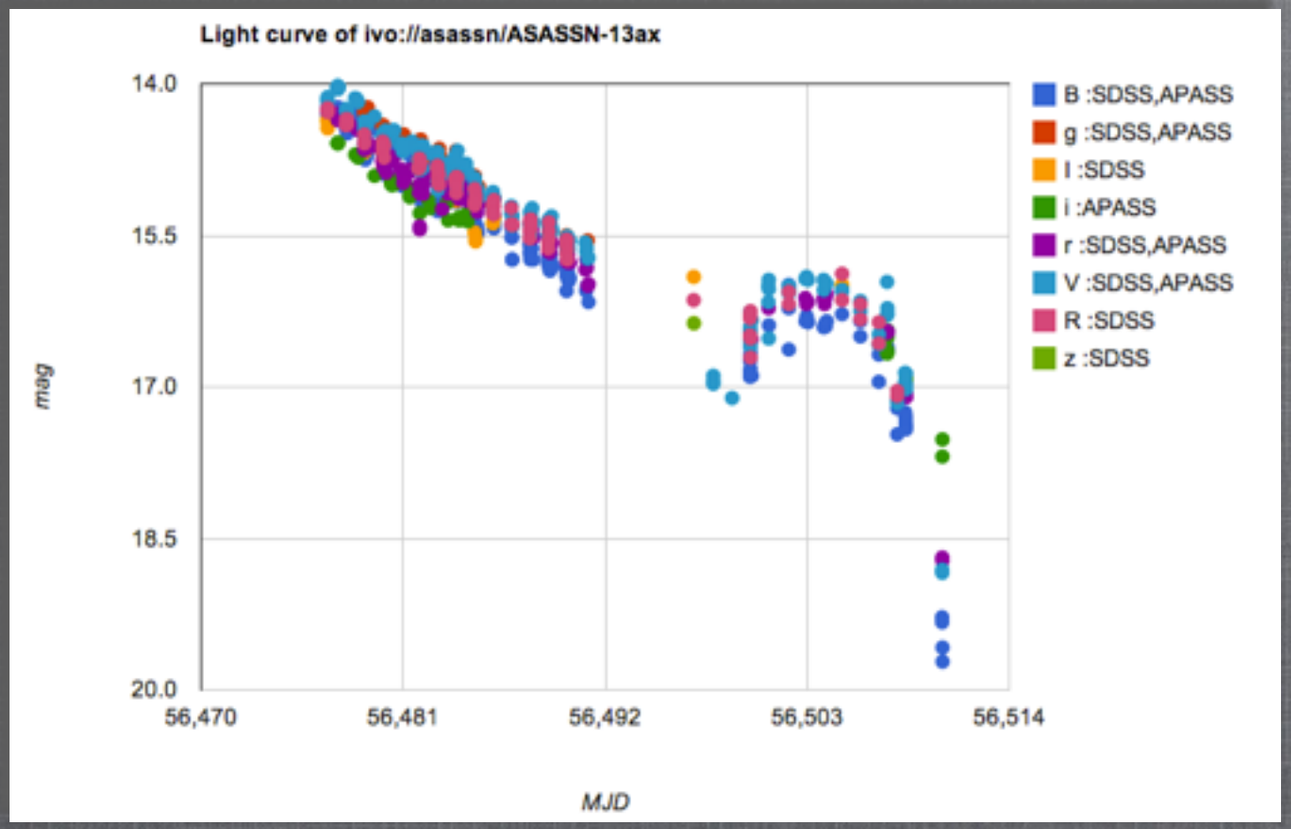
Logout

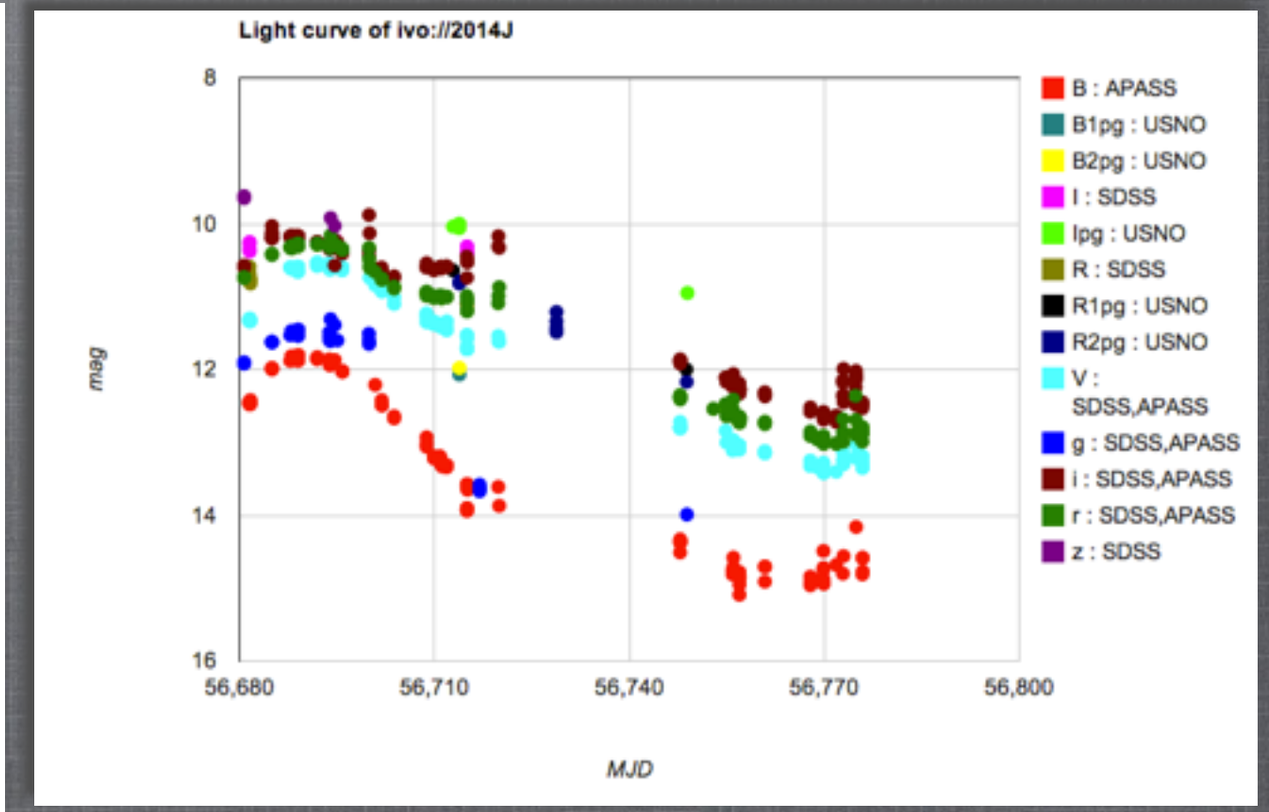
Manual

designed by Sergey Koposov and LW

FOLLOW-UP CALIBRATION SERVER

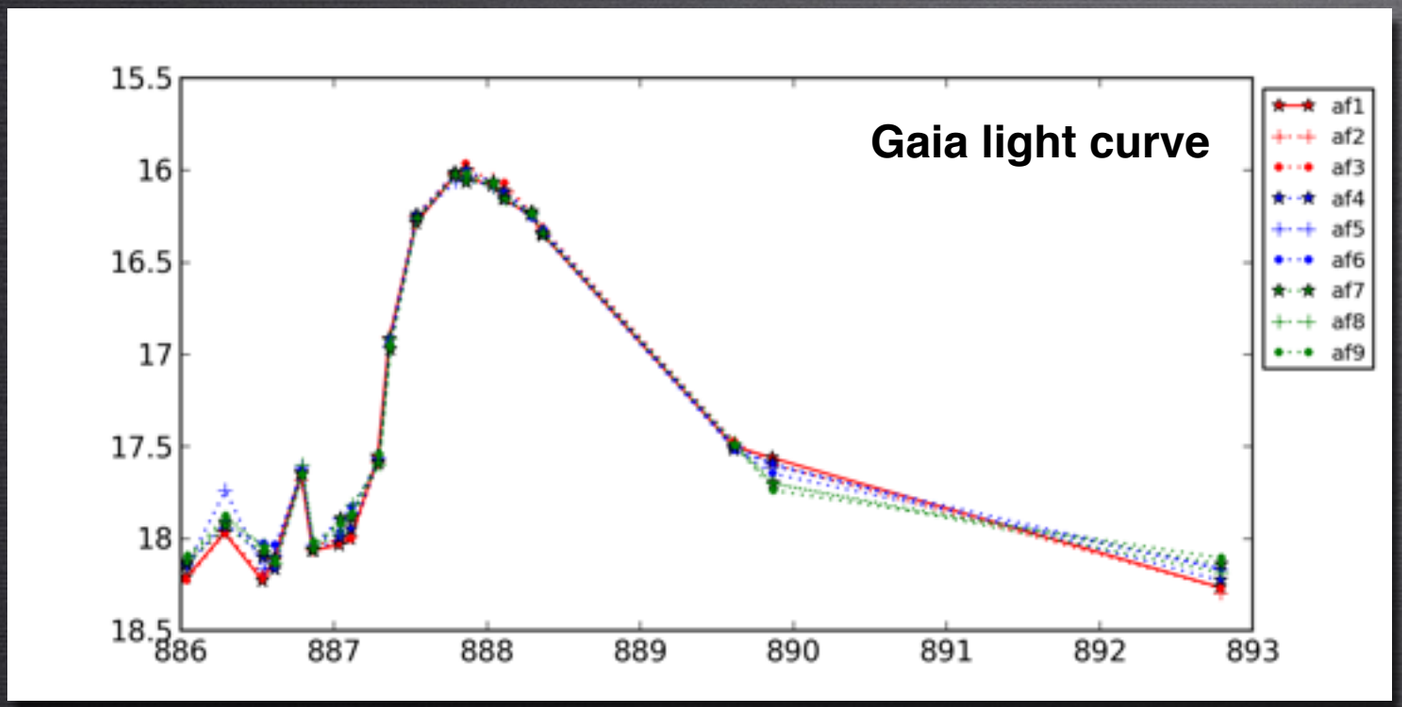
gsaweb.ast.cam.ac.uk/followup/





AM CVN-TYPE TRANSIENT

Gaia14aae

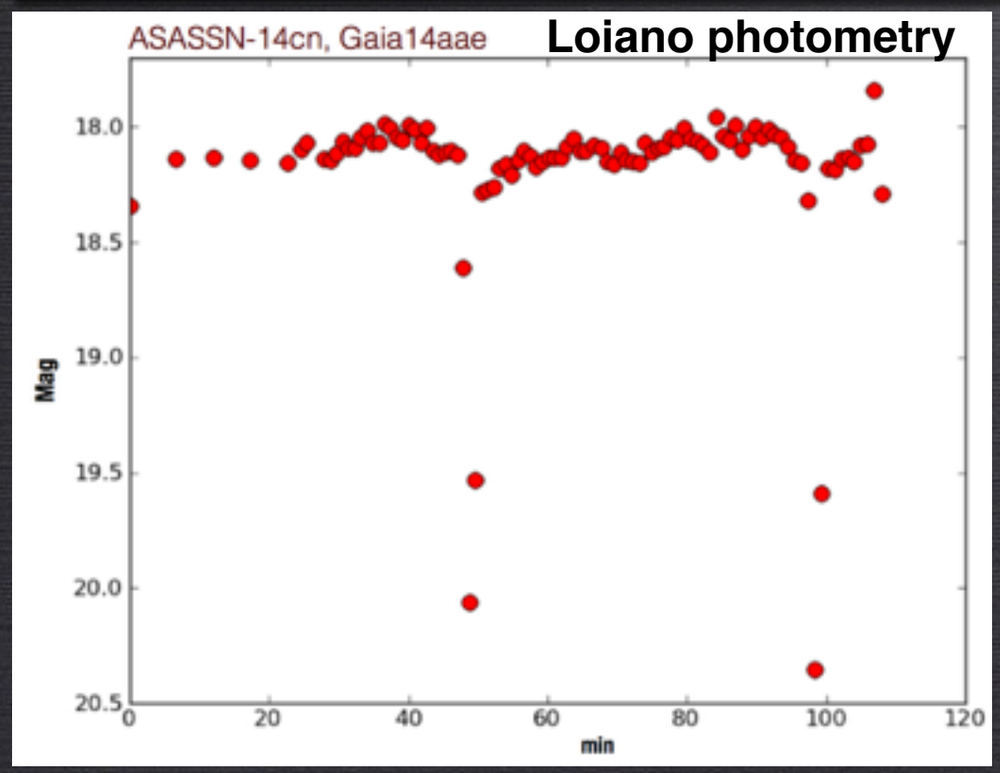


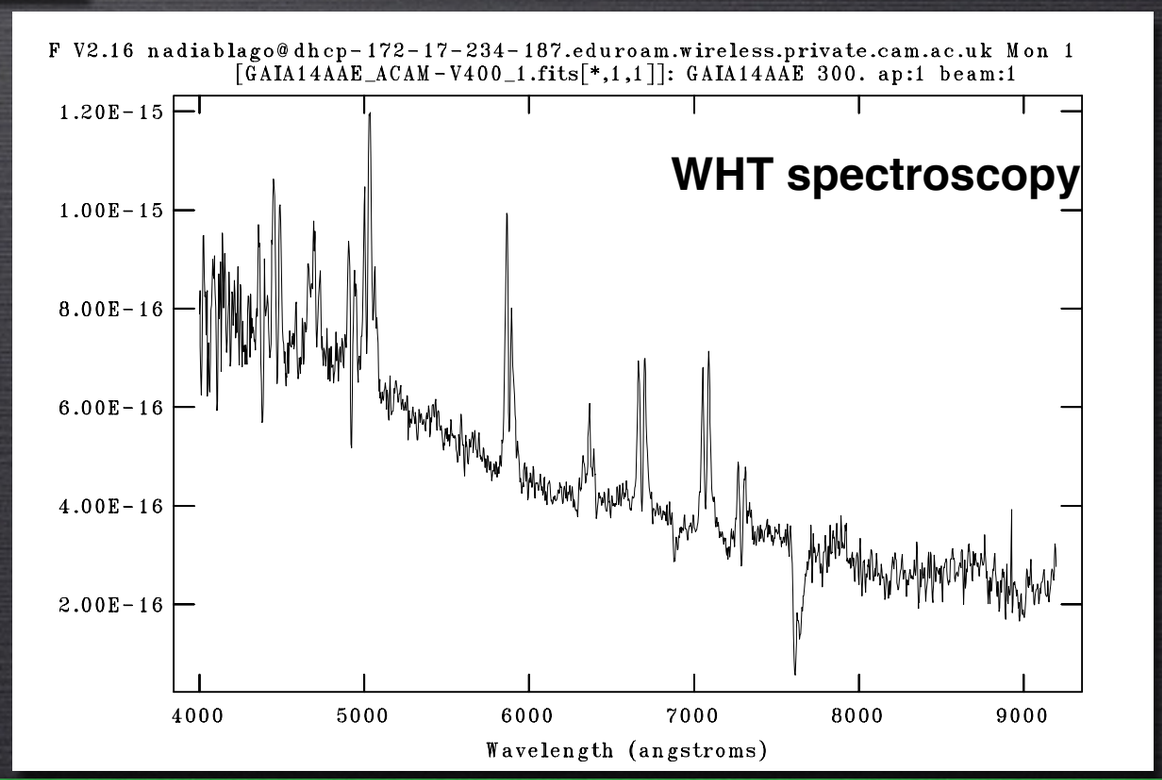
- very rare class of CVs (3rd!)
- candidate SN Ia progenitor
- WD accretes He material from another WD

Period 49.71 min

M1 ≥ 0.782 MSun, T1=13000

M2 ≥ 0.015 MSun





Campbell et al. 2015

first scientific paper to include OPTICON network follow-up data

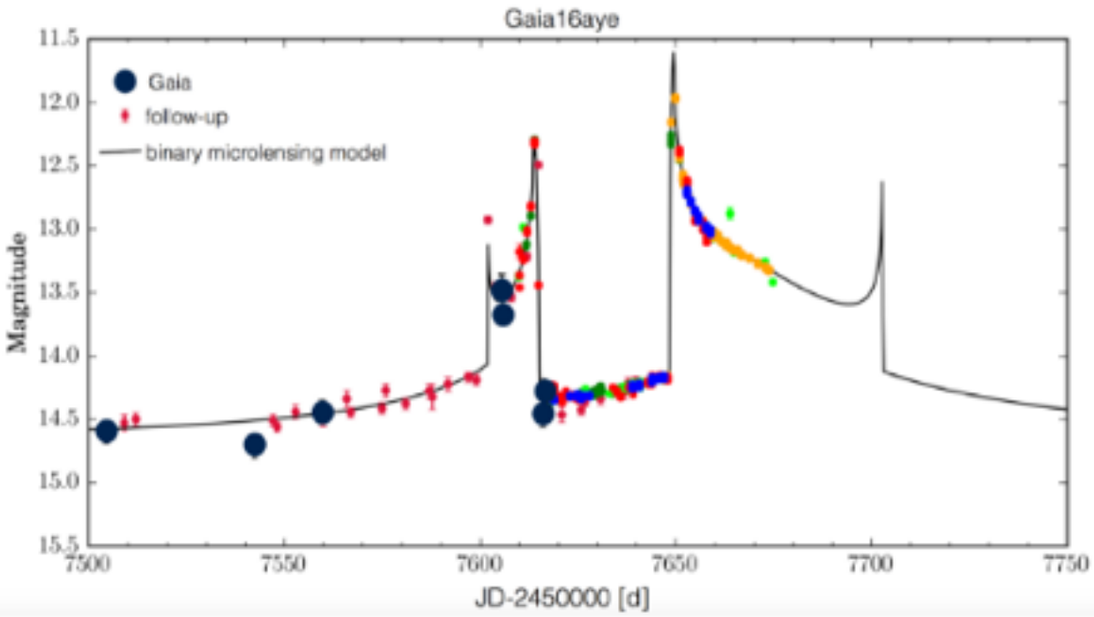
GAIA16AYE (AYERS ROCK)

First binary microlensing event outside of the Galactic Bulge

Follow-up was essential!

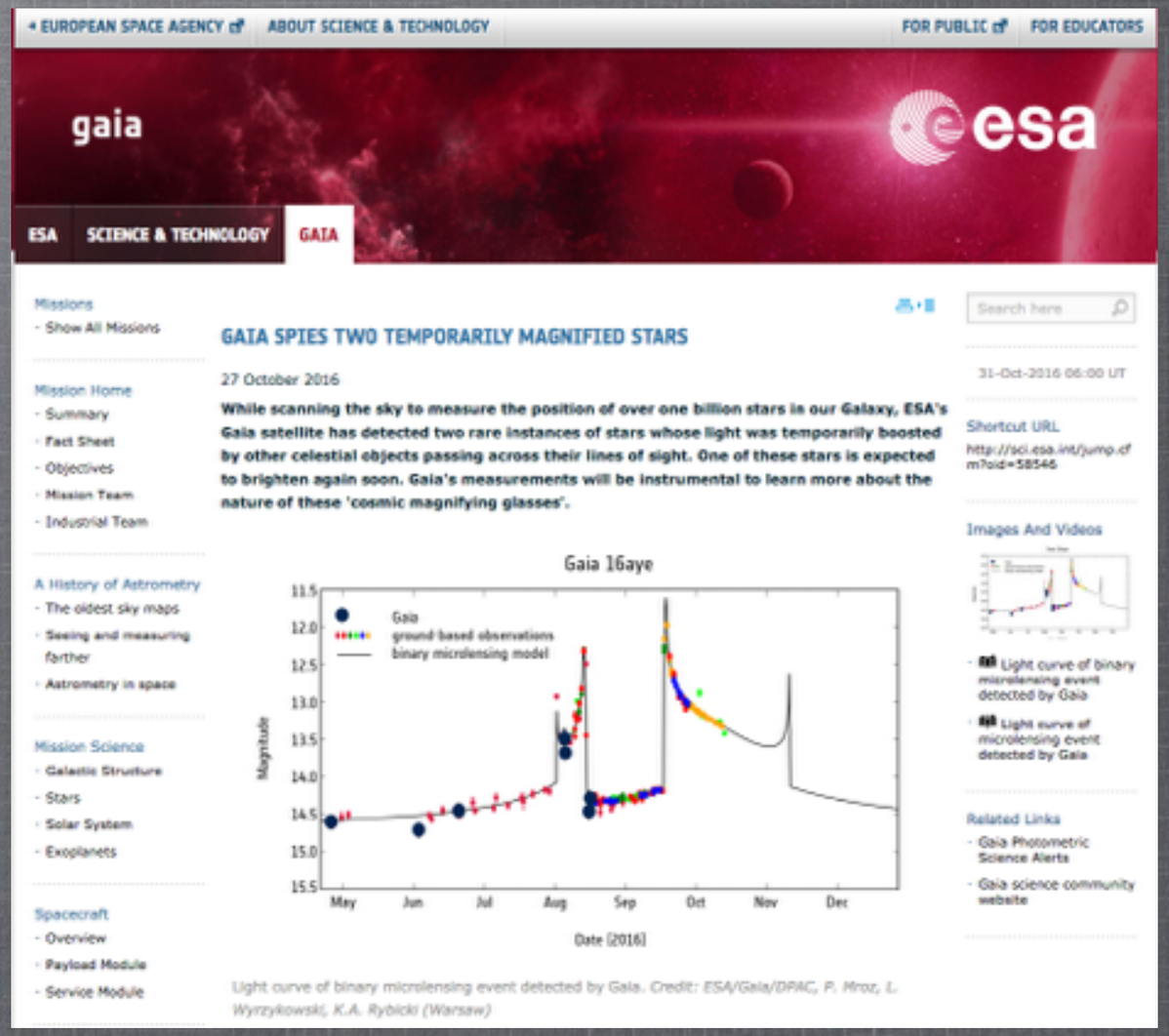
IMAGE OF THE WEEK

FOLLOW-UP OPPORTUNITY OF A RARE MICROLENSING EVENT



Light curve of the microlensing event Gaia16aye, composed by data from Gaia (dark spots) and supported by data from ground-based follow-up telescopes (each colour indicates a different observatory). The solid black line shows the current best microlensing model computed by Przemek Mróz. The sharp rises are called caustic crossings as explained in the text below.

http://www.cosmos.esa.int/web/gaia/IoW_20161027



http://sci.esa.int/gaia/58546-gaia-spies-two-temporarily-magnified-stars/

Involves AAVSO (US), amateurs from Italy, schools via LCOGT/Cardiff.
Will add German amateurs associations.

will be published as a scientific paper soon

H2020
TDA WP13 WORKFORCE

Warsaw University

Dr hab. Łukasz Wyrzykowski

+PDRA 4yrs

Liverpool John Moores University

Prof. Iain Steele

+PDRA 2yrs

Cambridge University

Prof. Gerry Gilmore

+PDRA 3yrs

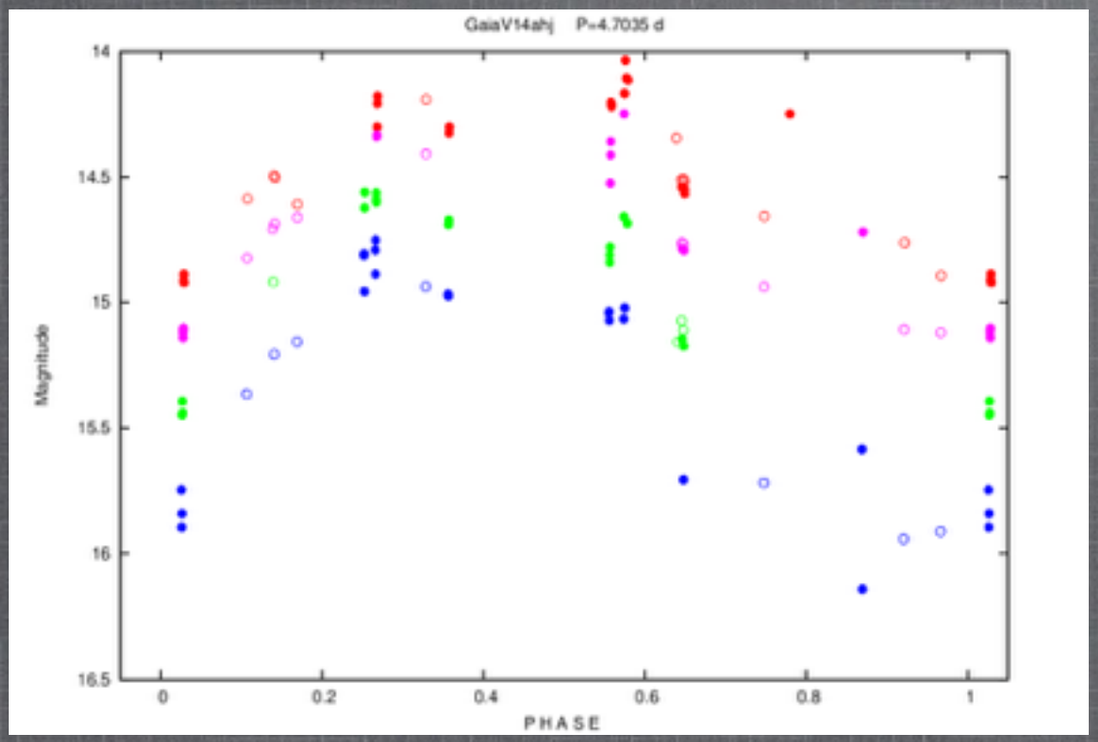
SRON, NL

Dr Peter Jonker

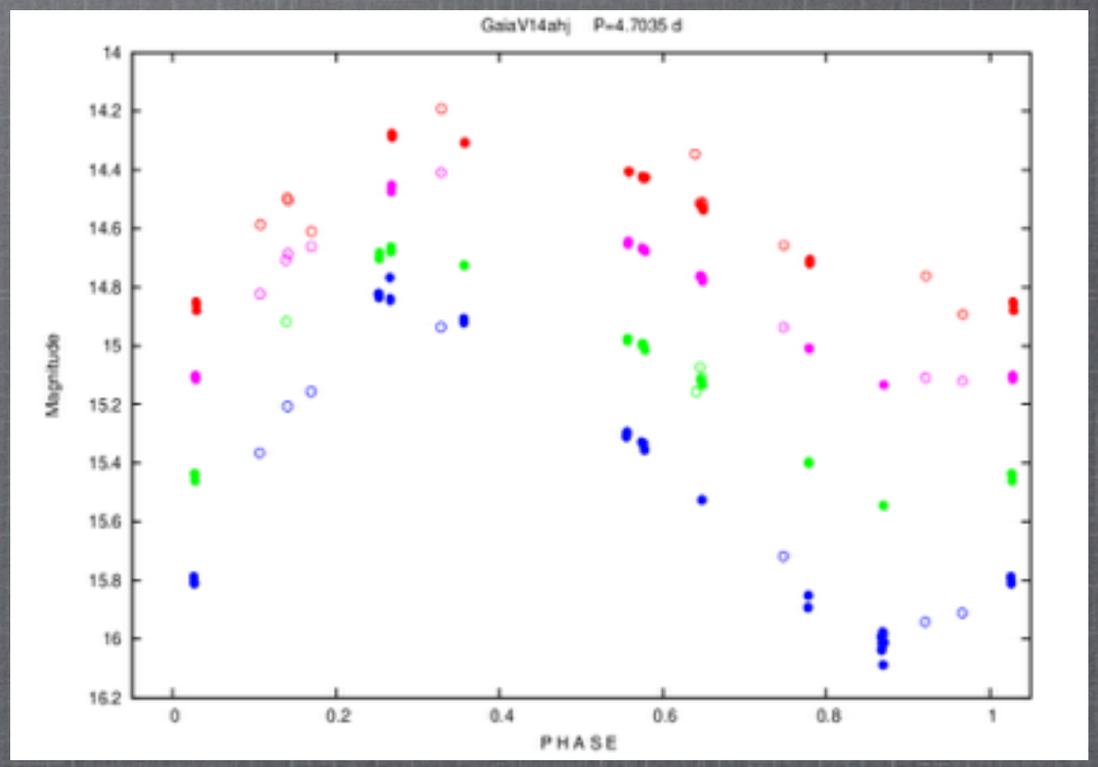
CALIBRATION SERVER 2.0

from image to science ready light curves!

current reductions



new reductions

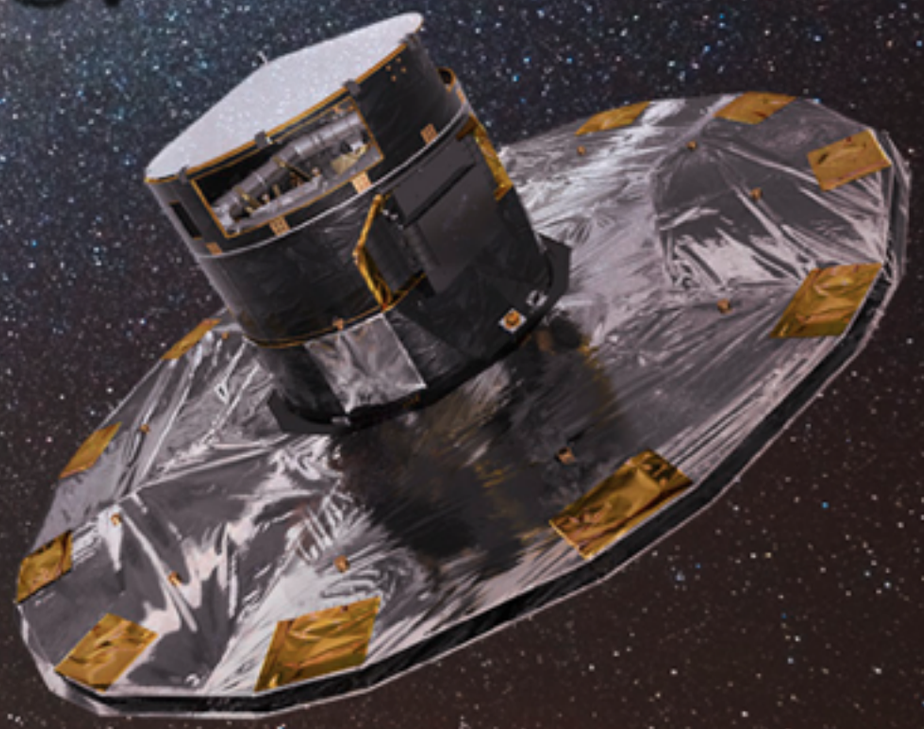


H2020 TASKS

- network management (webpages, mailing groups, workshops)
- integrate network to a “single observatory” with centralised open access data
- manage observing time on robotic telescopes in TNA
- coordinate science goals: recognise interesting targets for time-domain, provide platform between scientists and the network
- develop fully automated clever data reduction system: from an image to science-ready light curve/spectrum
- encourage robotisation of European small telescopes
- design SPRAT-lite spectrograph: cheaper, modular to fit any 1-2m class telescope

OPTICON

THANK YOU!



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Gaia DPAC

gaia

UNIVERSITAS VARSOVIENSIS

UNIVERSITY OF CAMBRIDGE

OPTICON

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SETTING SCIENCE AGENDAS FOR EUROPE