Go ogle – "open science" impact

Martin Dominik
University of St Andrews

University of St Andrews

SUPA

الصندوق القطري لرعاية البحث العلمي
Qatar National Research Fund
Member of Qatar Foundation

“Open Science”

A top buzzword in science policy

Principle

make scientific research, data, and dissemination accessible to all levels of an inquiring society

Carlos Moedas
(European Commissioner for Research, Science and Innovation)

“I see three strategic priorities: Open Innovation, Open Science, and Openness to the World.”

“I am convinced that excellent science is the foundation of future prosperity, and that openness is the key to excellence.”

(22 June 2015)

Key drivers

“A strongly-held belief in the value of free circulation (and criticism) of ideas...”

“A re-appreciation of the role of data by researchers”

Stakeholders tended to characterise Open science as a bottom-up or ‘grassroots’ phenomenon driven by researchers and the research community.

They generally agreed that policies should reflect the fact that Open science was and should remain researcher-driven.

(European Commission: “Validation of the results of the public consultation on Science 2.0: Science in Transition”)

OGLE EWS and microlensing data

OGLE-1998-BUL-01

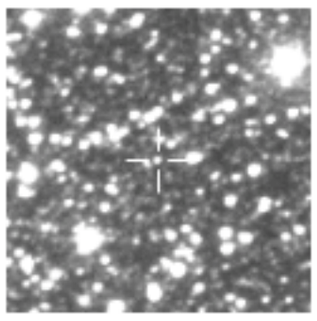
Field	BUL_SC3
Star No	469296
RA (J2000.0)	17:53:40.36
Dec (J2000.0)	-30:10:20.1
Remarks	

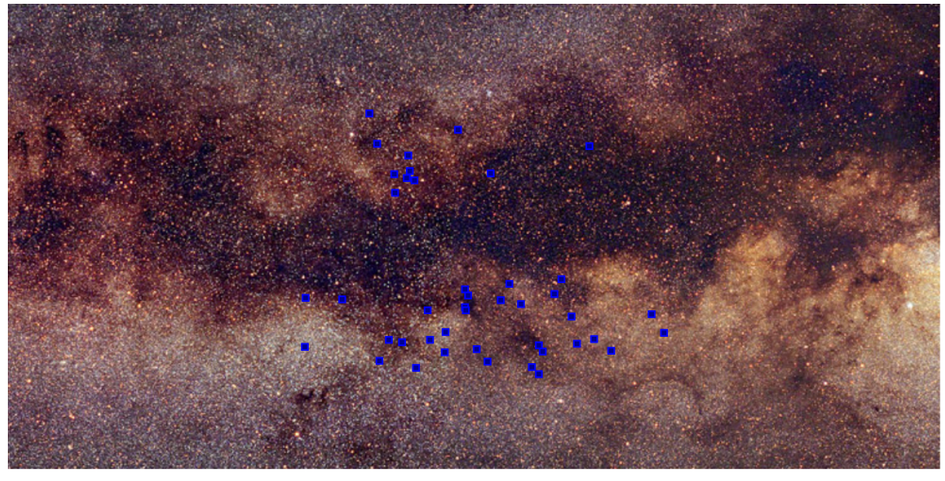
T_{max}	2450887.185 ± 0.460 (1998-03-14.69 UT)
tau	39.770 ± 1.073
A_{max}	3.263 ± 0.062
D_{mag}	1.284 ± 0.021
I_0	17.180 ± 0.003

Click here to download gzipped tar file containing full data set for this event.

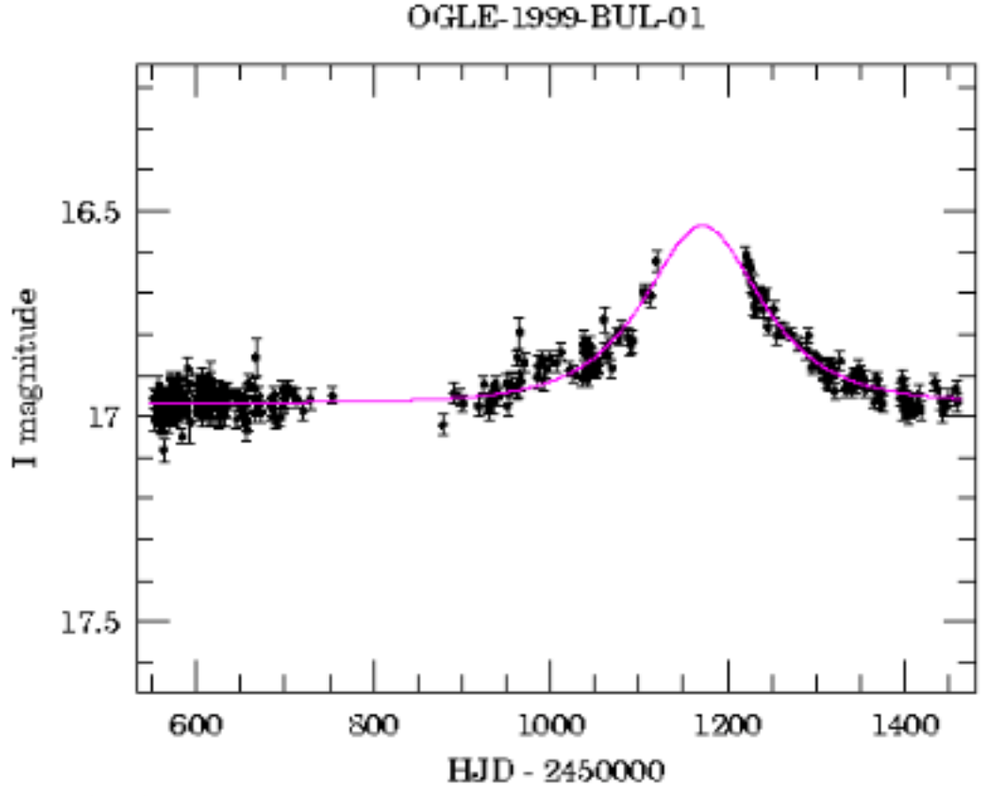
Go to main EWS page where info on other events can be found.

- Finding chart (available also in FITS format (without cross) and Postscript).
  The image size is 1' x 1', North is up and East is to the left.



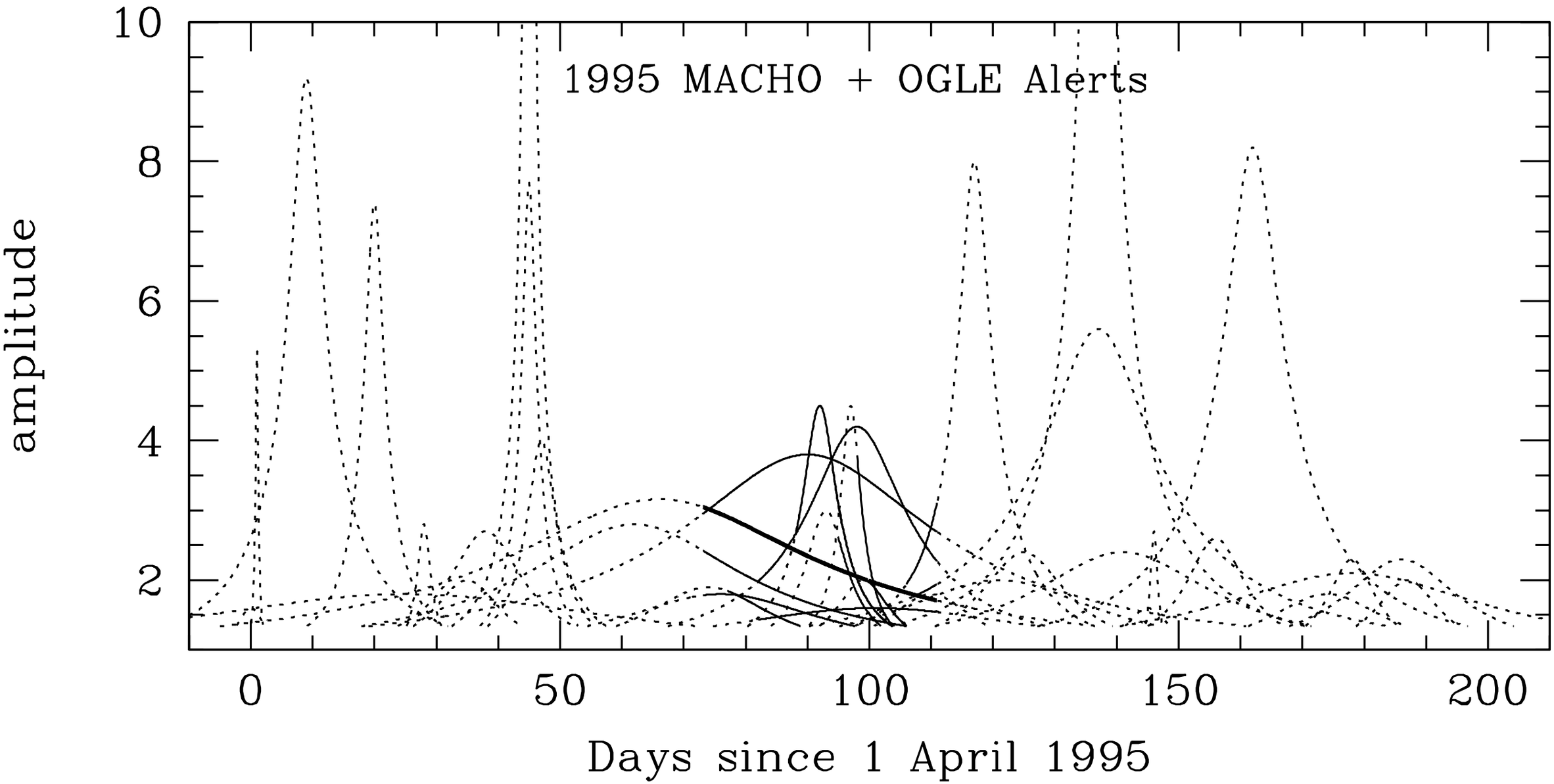


- Light curve (available also in Postscript format)



- Photometry data file containing 3 columns: Hel.JD, *I* magnitude and magnitude error.

Which event to choose?



Predictions tend to keep changing
Poor predictability in early event phase

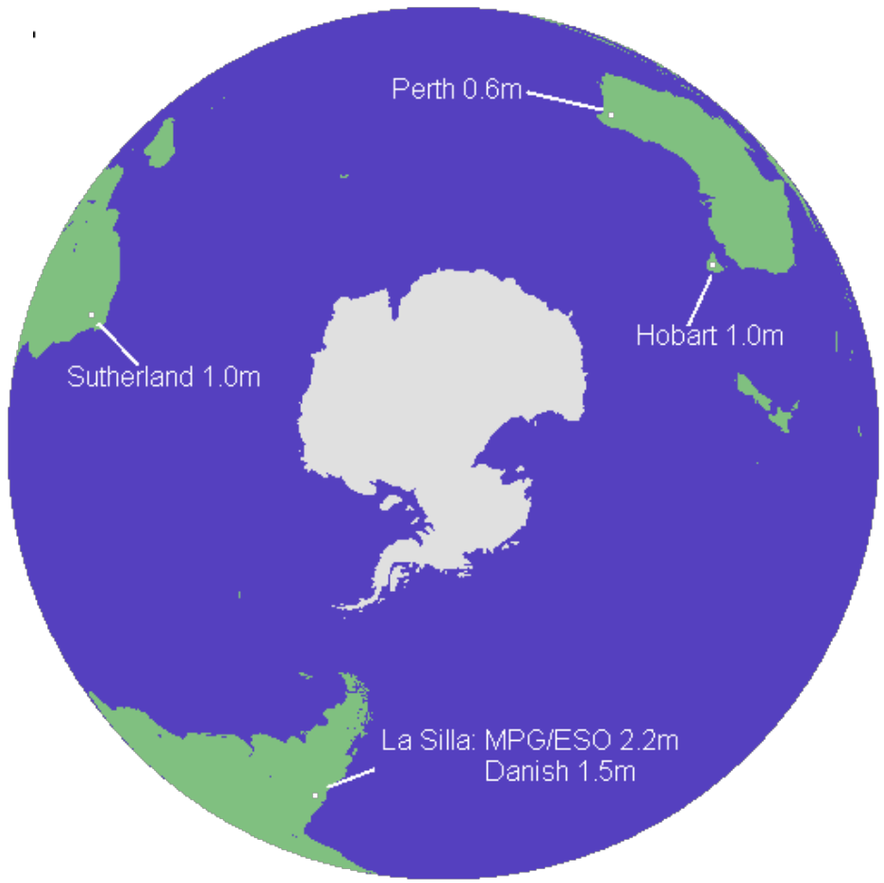
M. Dominik, "Discovery of a cool planet of 5.5 Earth masses through gravitational microlensing", Nature 439, 437 (2006)

The relatives of the OGLE family

Microlensing follow-up networks

PLANET

Probing Lensing Anomalies NETwork



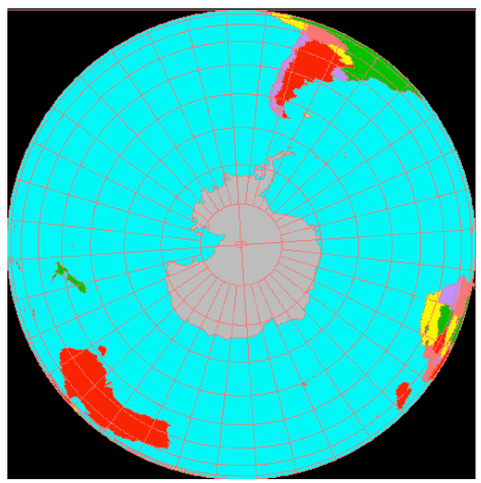
RoboNet

MiNDSTEp

Microlensing Network for the Detection of Small Terrestrial Exoplanets

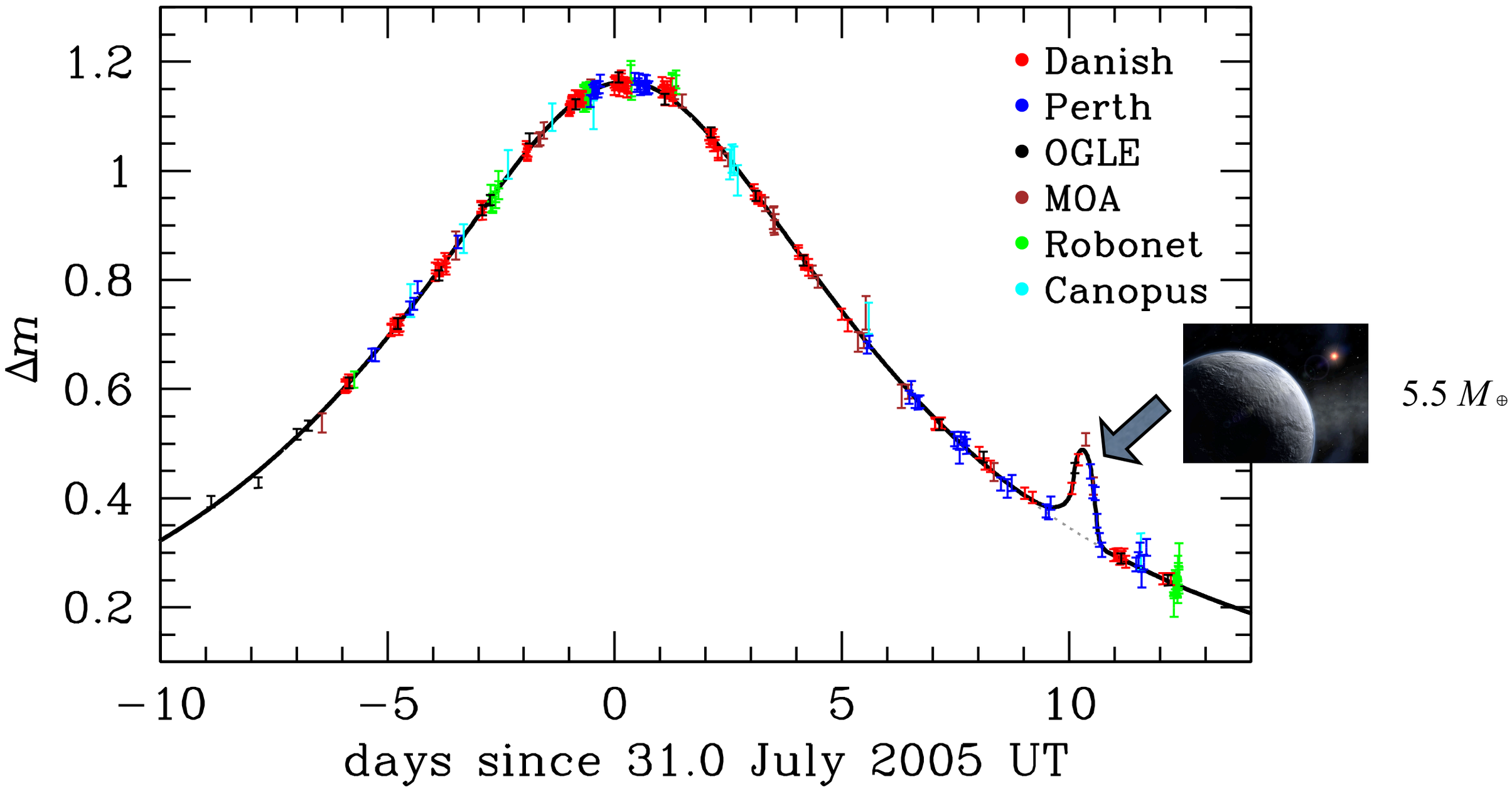
MicroFUN

Microlensing Planet Search Project

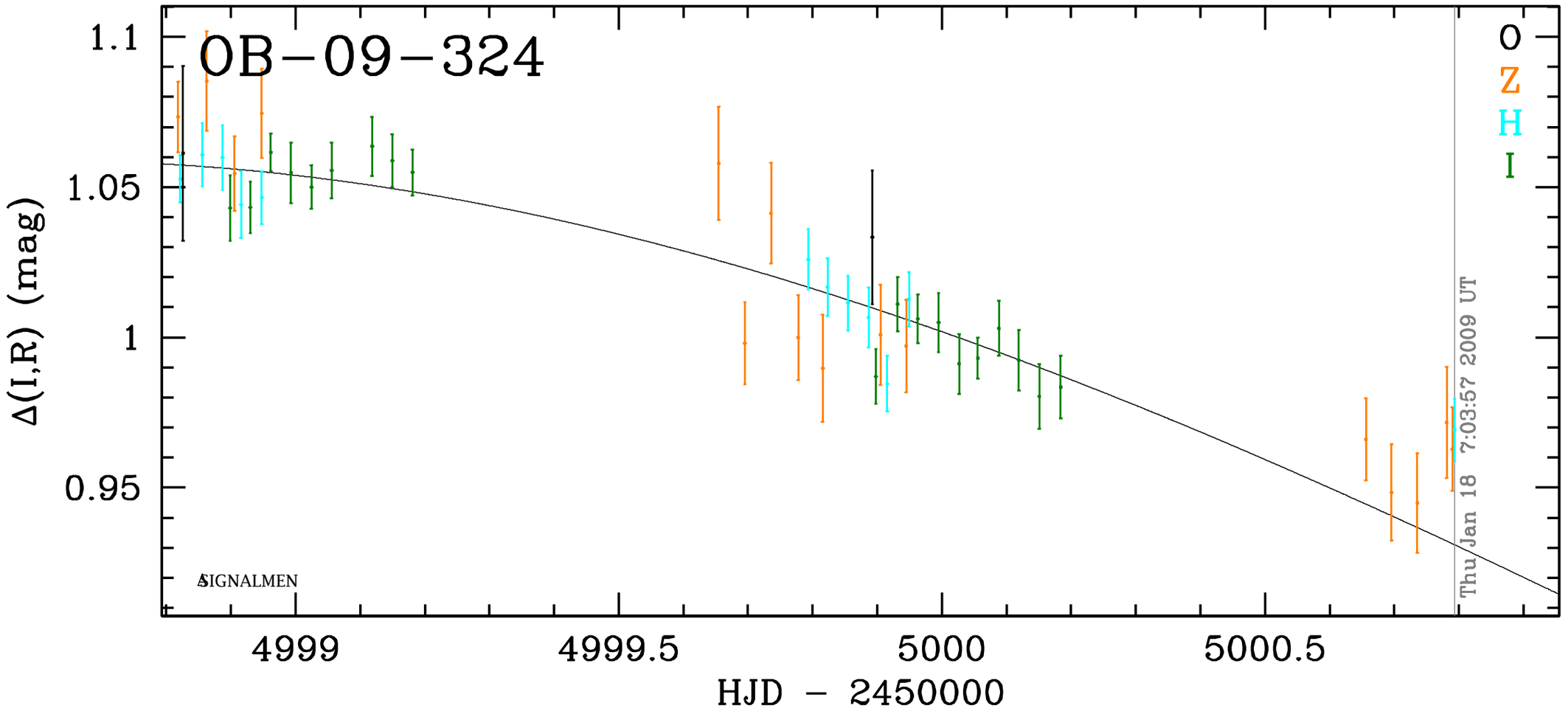


MICROLENSING FOLLOW-UP NETWORK

A small cool world

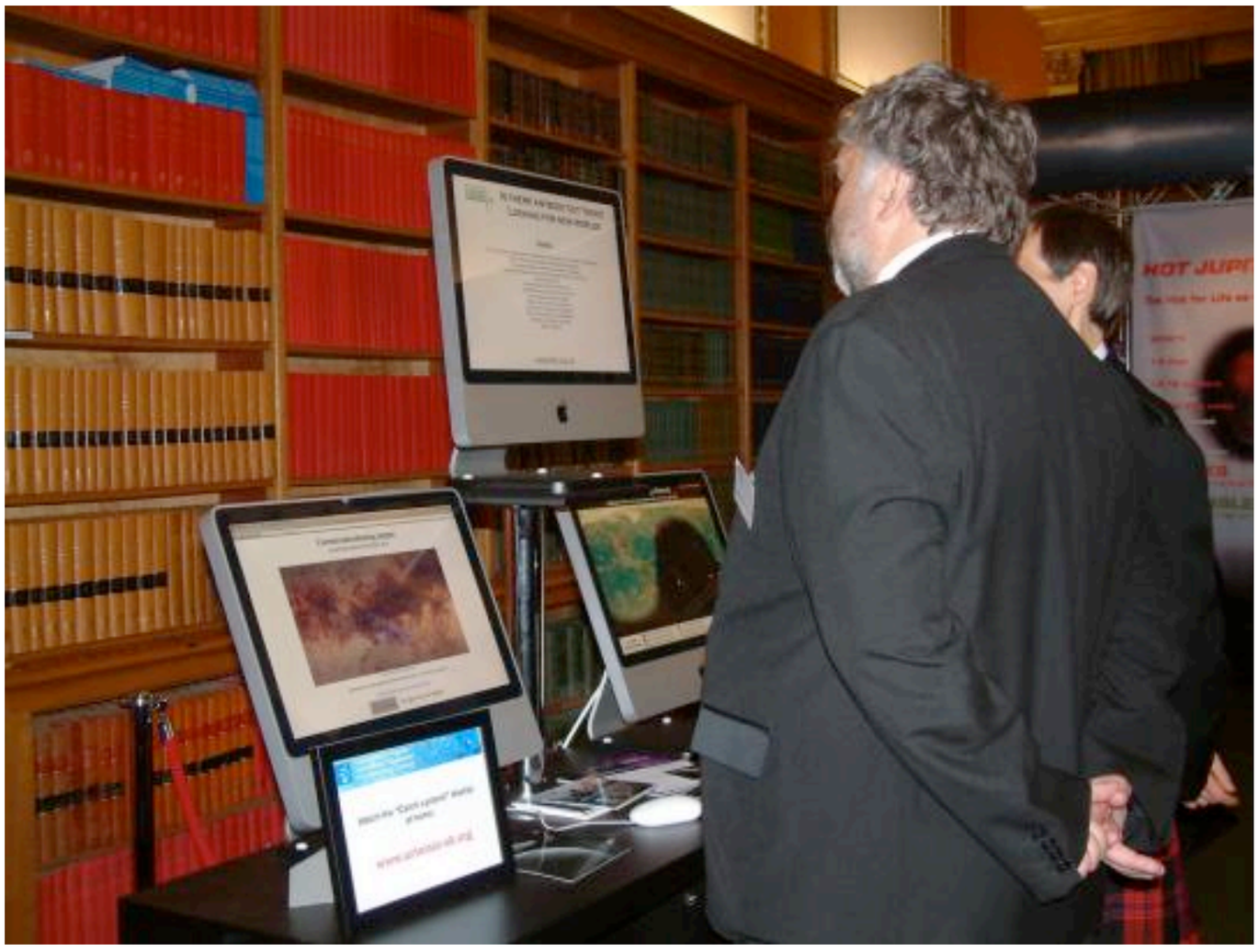


J.-P. Beaulieu et al., “Discovery of a cool planet of 5.5 Earth masses through gravitational microlensing”, Nature 439, 437 (2006)



Selected for the Royal Society's SUMMER SCIENCE EXHIBITION 08

Is there anybody out there?
Looking for new worlds



THE ROYAL SOCIETY
CELEBRATING 350 YEARS

London, 30 June to 3 July 2008
www.summerscience.org.uk

Techfest
24 - 26 January 2009

Mumbai, 24 to 26 January 2009
www.techfest.org

EDINBURGH INTERNATIONAL science festival

Edinburgh, 6 to 11 April 2009
www.sciencefestival.co.uk

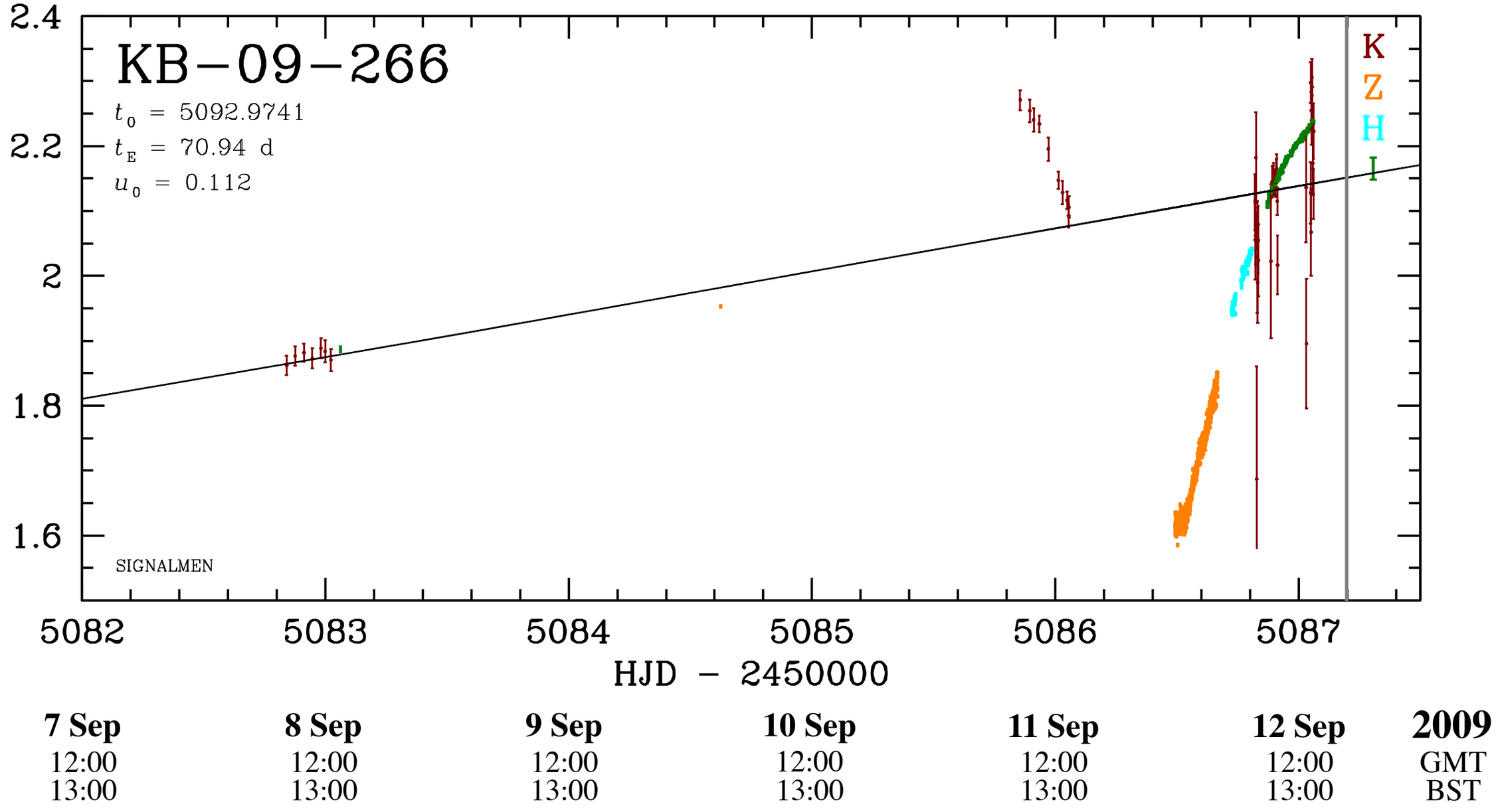
ARTEMIS

Catch a planet - *live*

www.artemis-uk.org/catch-a-planet.html

Automated Robotic Terrestrial Exoplanet Microlensing Search

ARTEMIS



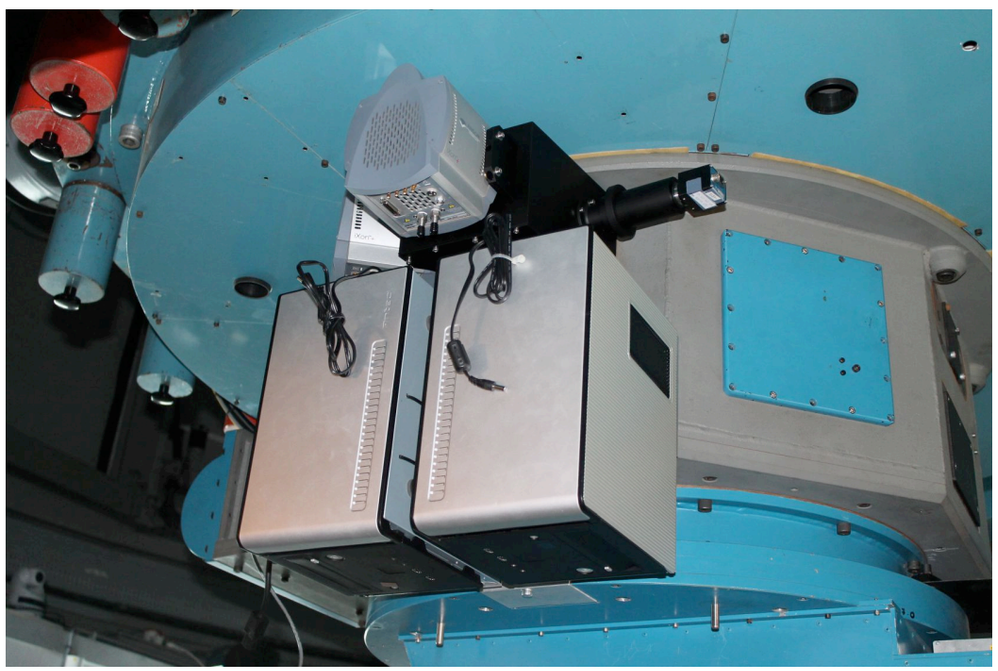
7 Sep	8 Sep	9 Sep	10 Sep	11 Sep	12 Sep	2009
12:00	12:00	12:00	12:00	12:00	12:00	GMT
13:00	13:00	13:00	13:00	13:00	13:00	BST

Catch a planet - *live*

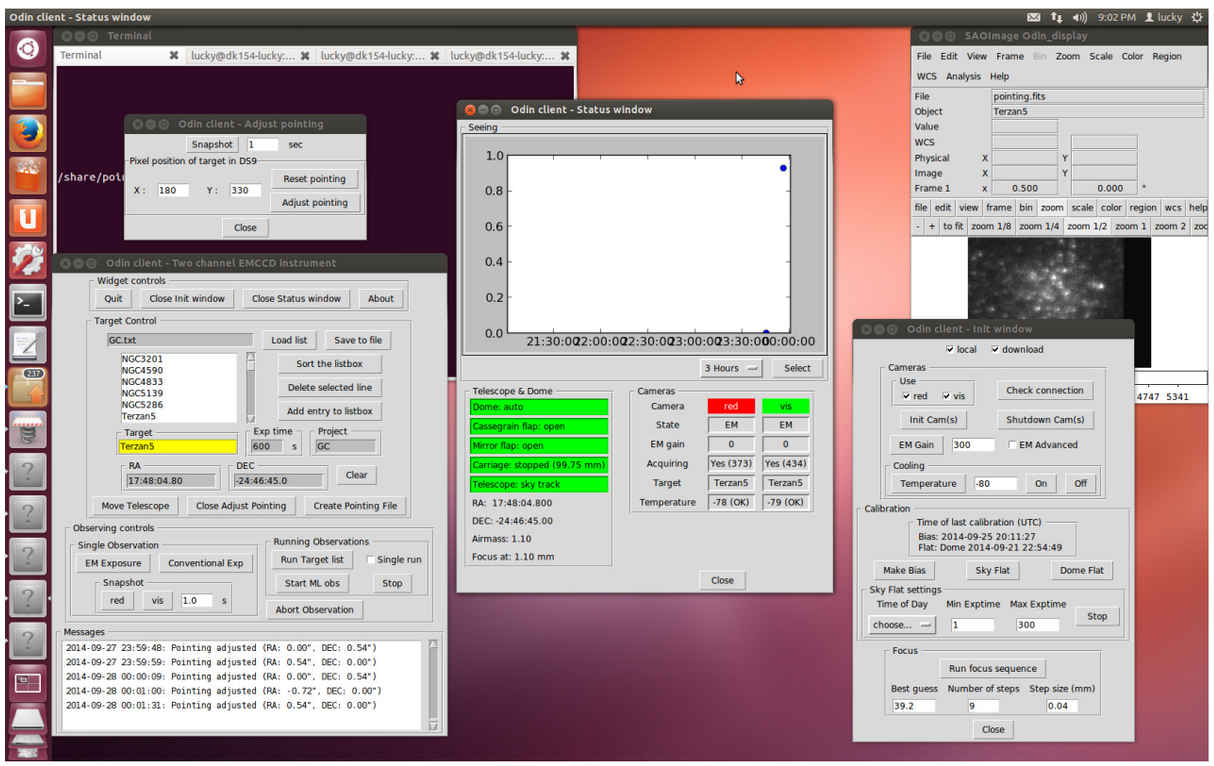
www.artemis-uk.org/catch-a-planet.html

Danish 1.54m @ ESO La Silla

automation paid by Czech community (using telescope in Southern summer)

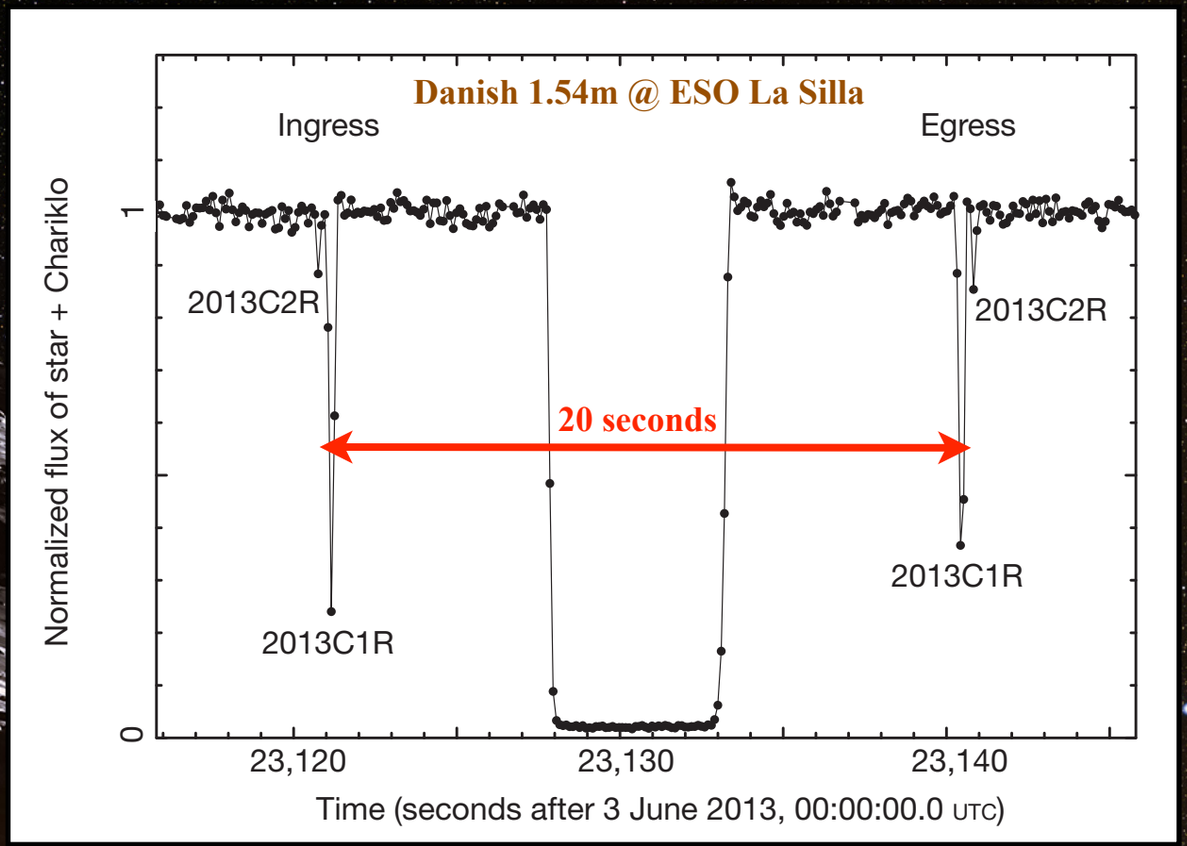


two-colour EMCCD camera



new telescope control system client

The rings of Chariklo

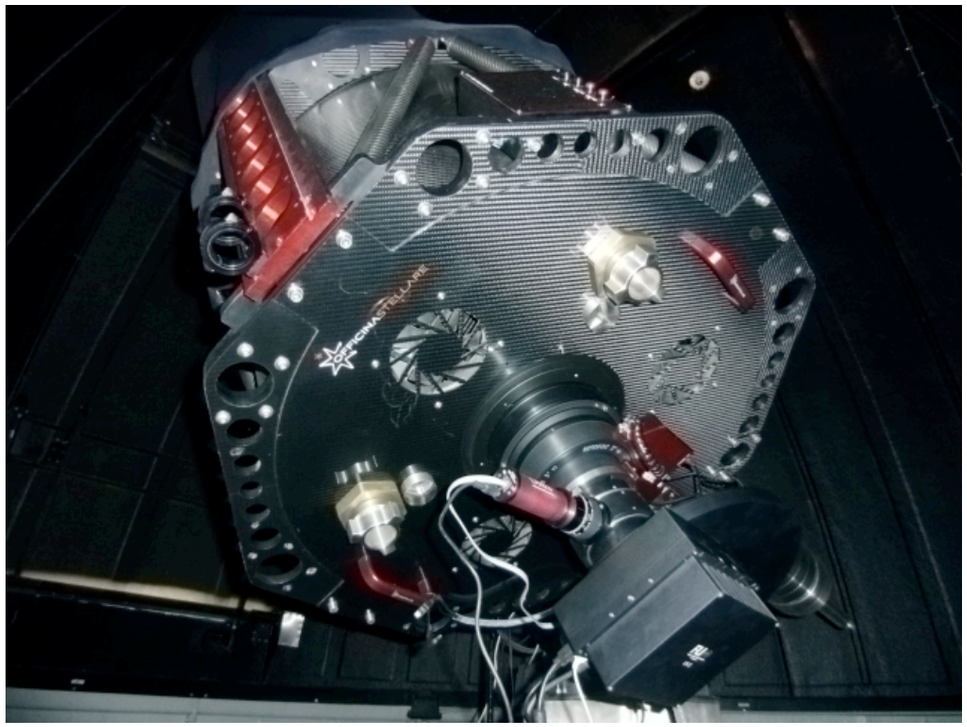


Nature 508, 72 (2014)

Greenhill Observatory

Harlingten 1.27m telescope

Salerno University Observatory 0.6m



The LCOGT.net network

1×2m

1×1m

3×1m

3×1m

1×2m
2×1m

- Operational Sites
- Planned Sites
- Under Consideration

3×1m telescopes

percentage of observing time on the LCOGT network equivalent to 3×0.55 telescopes

OGLE

Academic assessment

"Research outputs"

≠ "Research outcomes"

DC1 Data Citation Principles

International Council for Science – Committee on Data for Science and Technology

1. Importance

Data should be considered legitimate, citable products of research. Data citations should be accorded the same importance in the scholarly record as citations of other research objects, such as publications.

2. Credit and Attribution

Data citations should facilitate giving scholarly credit and normative and legal attribution to all contributors to the data, recognizing that a single style or mechanism of attribution may not be applicable to all data.

3. Evidence

In scholarly literature, whenever and wherever a claim relies upon data, the corresponding data should be cited.

4. Unique Identification

A data citation should include a persistent method for identification that is machine actionable, globally unique, and widely used by a community.

5. Access

Data citations should facilitate access to the data themselves and to such associated metadata, documentation, code, and other materials, as are necessary for both humans and machines to make informed use of the referenced data.

6. Persistence

Unique identifiers, and metadata describing the data, and its disposition, should persist -- even beyond the lifespan of the data they describe.

7. Specificity and Verifiability

Data citations should facilitate identification of, access to, and verification of the specific data that support a claim. Citations or citation metadata should include information about provenance and fixity sufficient to facilitate verfiying that the specific timeslice, version and/or granular portion of data retrieved subsequently is the same as was originally cited.

8. Interoperability and Flexibility

Data citation methods should be sufficiently flexible to accommodate the variant practices among communities, but should not differ so much that they compromise interoperability of data citation practices across communities.

"Impact"

Impact evaluation assesses the changes that can be attributed to a particular intervention, such as a project, programme or policy, both the intended ones, as well as ideally the unintended ones.

EXCELLENCE WITH IMPACT

UK: arbitrary distinction between academic impact and non-academic impact

EC Open Science Policy Platform

Steering Group of the Policy Platform
(20 Members, co-chaired by the Commission, meets bi-annually)
Mandate: Develop the Open Science Policy Agenda; Promote uptake of agreed best policy practices

- Working Group Rewards
- Working Group Alt-Metrics
- Working Group Research Integrity
- Working Group Citizen Science
- Working Group Open Education and skills
- Working Group Changing Business Models
- Working Group Fair Open Data
- Working Group Open Science Cloud

Stakeholder groups

Universities, Research Organisations, Academies/Learned Societies, Funding Organisations, Citizen Science Organisations, Publishers, Open Science Platforms/Intermediaries, Libraries

Next-generation metrics:
Responsible metrics and evaluation for open science

Report of the European Commission Expert Group on Altmetrics

James Wilsdon, Professor of Research Policy at University of Sheffield (UK)
Judit Bar-Ilan, Professor of Information Science at Bar-Ilan University (IL)
Robert Frodeman, Professor of Philosophy at the University of North Texas (US)
Elisabeth Lex, Assistant Professor at Graz University of Technology (AT)
Isabella Peters, Professor of Web Science at the Leibniz Information Centre for Economics and at Kiel University (DE)
Paul Wouters, Professor of Scientometrics and Director of the Centre for Science and Technology Studies at Leiden University (NL)

Next-generation metrics:
Responsible metrics and evaluation for open science

Research and Innovation

RECOMMENDATION #2:
The EC should encourage the development of new indicators, and assess the suitability of existing ones, to measure and support the development of open science.

RECOMMENDATION #3:
Before introducing new metrics into evaluation criteria, the EC needs to assess the likely benefits and consequences as part of a programme of 'meta-research'.

RECOMMENDATION #5:
The EC should highlight how the inappropriate use of indicators (whether conventional or altmetrics or next generation metrics) can impede progress towards open science.

"It is however of fundamental importance not to mistake reach for benefit, or to mistake reach for quality. It needs much care to avoid misinterpreting metrics, and for each of these, it needs awareness of what exactly they measure, and sometimes even more importantly, what they do *not* measure. The scientific community is already witnessing the misuse of metrics, which leads to the detriment of both scientific and societal progress. Developing policies that overcome and prevent this should be a priority."

"We think that policy-makers should monitor carefully how scientists creatively embrace new technology before jumping to conclusions and setting out new frameworks. Good scientists are eager achievers. There should not be any rush to policies that eventually stand in their way by creating additional burden or limiting them in unfolding their creativity".

GLOBAL YOUNG ACADEMY