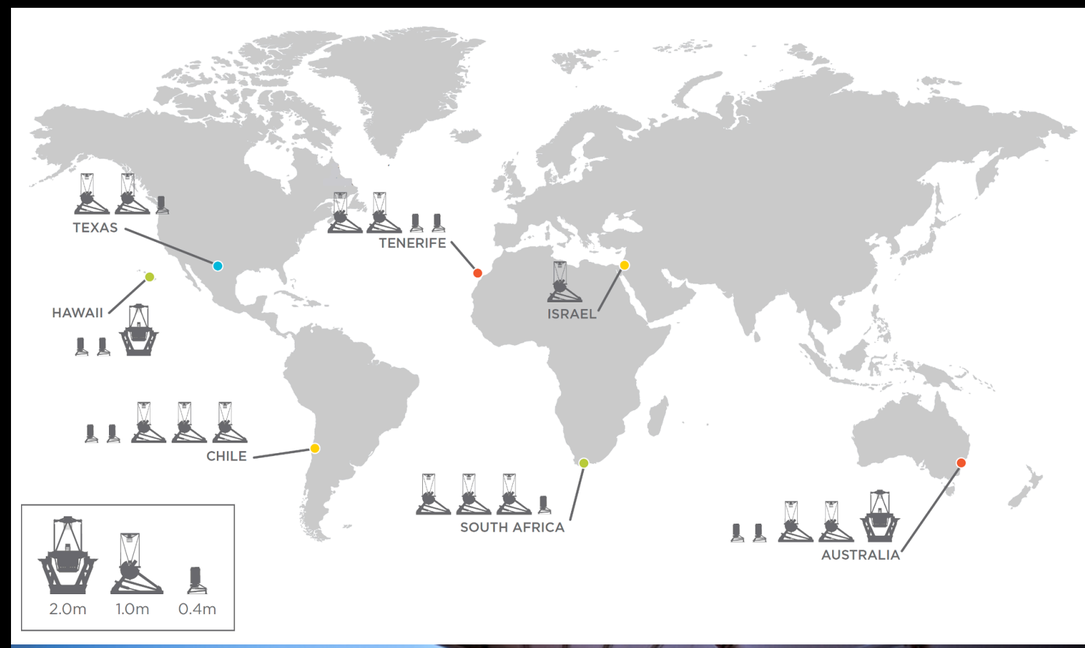
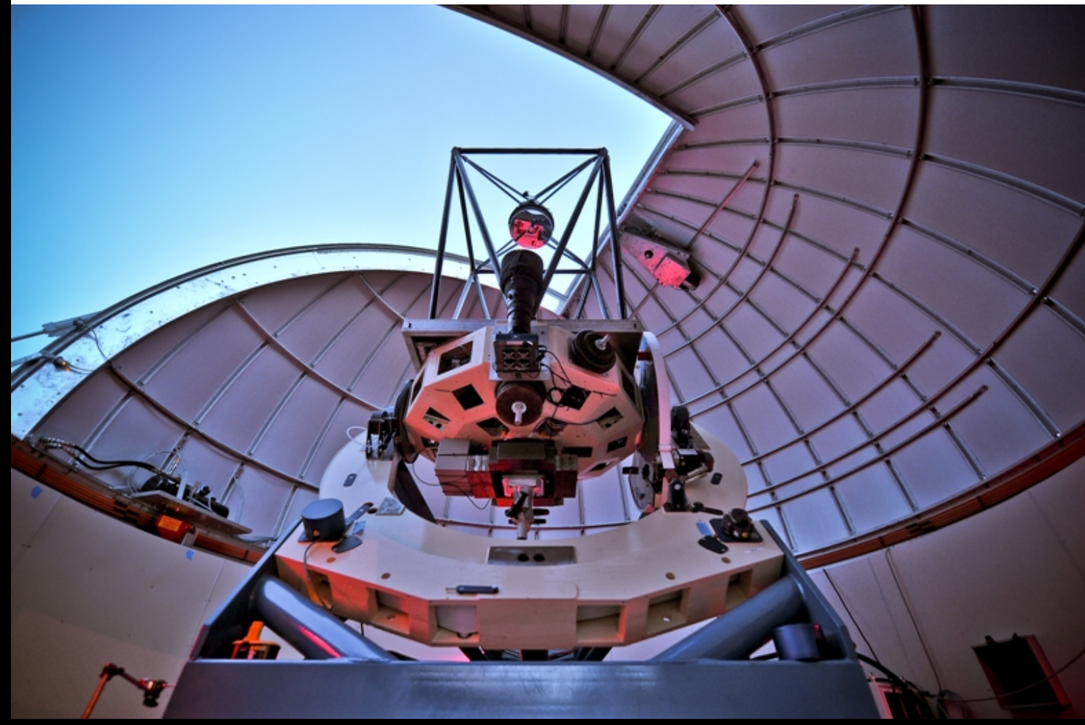
The LCO global telescope network

partner in transnational access





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University of St Andrews

St Andrews Centre for Exoplanet Science

SUPA

NoR CEL
Network of Researchers on the Chemical Emergence of Life

McDonald Observatory

TEXAS

TENERIFE

Teide Observatory

(under construction)

Ali Observatory

TIBET/CHINA

HAWAII

ISRAEL

Wise Observatory

Haleakala Observatory

CHILE

Cerro Tololo Interamerican Observatory

SOUTH AFRICA

South African Astronomical Observatory

AUSTRALIA

Siding Spring Observatory

2.0m 1.0m 0.4m

LCO

Las Cumbres Observatory

25 telescopes at 7 sites around the world working together as a single instrument

almost* round-the-clock access to the whole sky

*** except for: weather, technical outage, moon proximity, short visibility gaps**

Las Cumbres Observatory

Science Collaboration

Institution	Approximate hours per year		
	2m	1m	0.4m
Australian National University	200	400	400
AURA (on behalf of the Chilean astronomical community)	0	600	400
Faulkes Telescope Project	620	0	0
Institute for Astronomy, University of Hawaii	300	0	600
National Astronomical Observatories, China	0	600	0
National Science Foundation	400	2500	0
South African Astronomical Observatory	0	600	400
St. Andrews University	0	3300	0
University of Texas	0	600	300
Wise Observatory/I-CORE	0	1400	0
Instituto de Astrofisica de Canarias	0	800	800
Las Cumbres Observatory allocates the remaining time to Key Projects, regular and Director's Discretionary proposals, and the Global Sky Partners.			
Las Cumbres Observatory, Inc.	2480	15300	17100
Total	**4000**	**26000**	**20000**

Las Cumbres Observatory

What makes it unique?

Purpose-built to observe transient astronomical events
ranging in duration from seconds to several years

Global distribution of telescopes
long-duration monitoring and immediate targeting

Dynamic observation scheduling
entire network plan updated every 5 min

Uniform instrumentation across the network
simultaneous and in-sequence observations across sites

Fully robotic observations
round-the clock operation with automated calibration

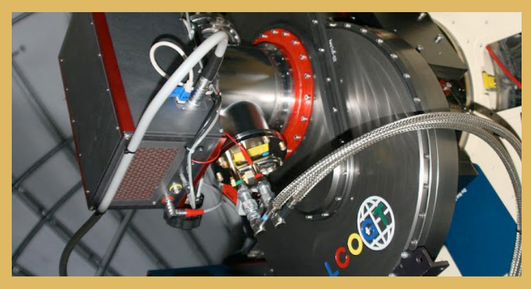
Rapid delivery of data
calibrated science data available within minutes

rapid response – uninterrupted monitoring – full sky

LCO 1m (purpose-designed and built in-house)

Mounting	Equatorial C-ring
Basic Optics	*f*/8 Ritchey-Chrétien Cassegrain
Slewing speed	6 deg/sec
Tracking accuracy w/o guiding	0.5″ RMS
Blind pointing accuracy	3..10″
Altitude limit	15° (~ airmass 3.9)
Hour angle limits	-4.6 to 4.6 hrs

Imager

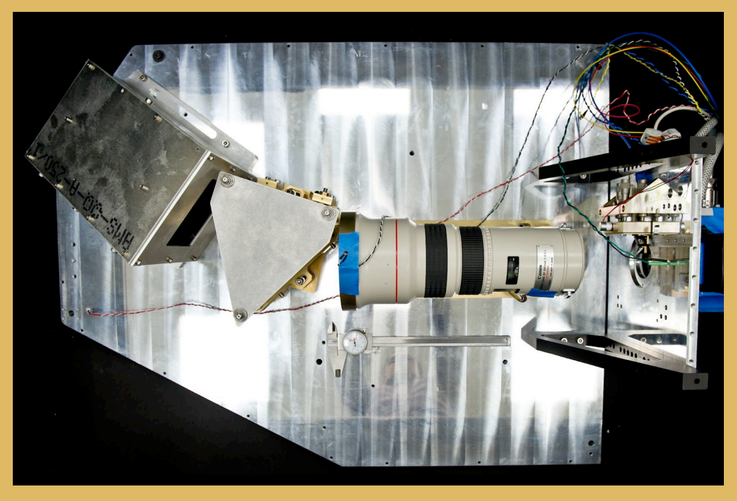


“Sinistro”:
Fairchild CCD-486 BI (4K×4K @ 15μm)
0.39″/pixel, FoV 26.5′×26.5′
28 sec overhead per frame
9 sec overhead in central 2K×2K binned mode

complete Johnson-Cousins/Bessell set (UBVRI)
SDSS/PanSTARRS set (u’g’r’i’z_sYw)

approximate magnitude range: 8 –19

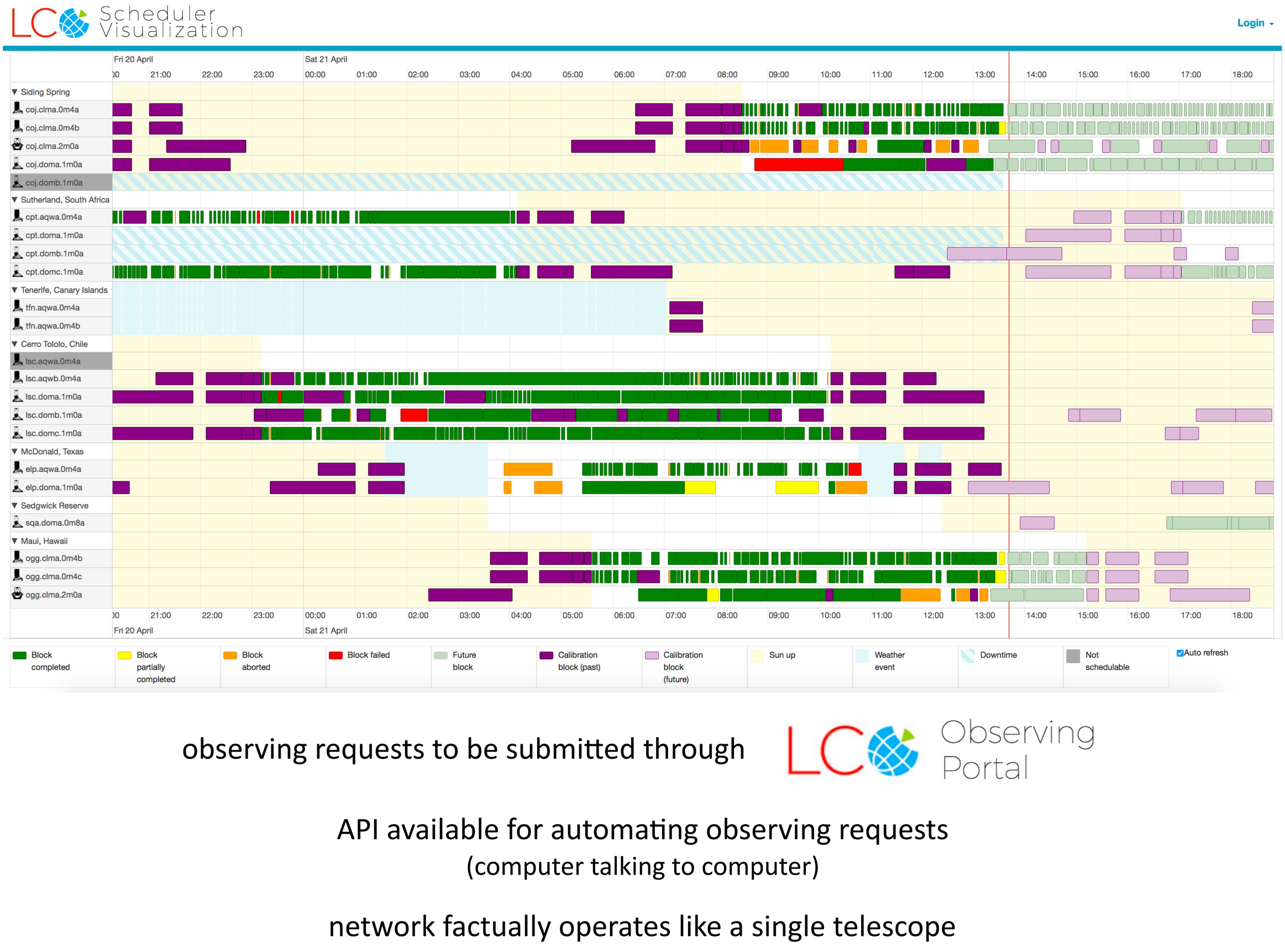
High-resolution spectrograph



“NRES”:
Optical Echelle Spectrograph (380..860nm)
R~53 000, ≤ 3 m/s, fiber-fed

approximate magnitude range: 5 –12

Automated scheduling of observations



observing requests to be submitted through LCO Observing Portal

API available for automating observing requests
(computer talking to computer)

network factually operates like a single telescope

Never underestimate the creativity of your users

uninterrupted time series

rapid reponse

transients (e.g. SNe, GRBs, ML events, TDFs…)
variable brightness (e.g. planetary transits, stellar rotation, AGN reverberation mapping, novae…)
variable spectrum (e.g. RV planets, asteroseismology…)
moving objects (e.g. NEOs, TNOs…)

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Keywords from observing proposals (2024B)

extra-solar planets
circumplanetary disks
stellar-mass black holes
supermassive black holes
white dwarfs
active galactic nuclei (AGNs)
quasar variability
supernovae
pulsars
gravitational microlensing events
gravitational wave events

stellar binaries
stellar structure and evolution
low-mass stars
X-ray binaries
fast radio bursts (FRBs)
gamma-ray bursts
near Earth objects (NEOs)
Solar-system minor bodies
asteroids
comets

VERA C. RUBIN OBSERVATORY

LSST Legacy Survey of Space and Time

up to 10,000,000 alerts on transients per night
(~ early 2026)

Dealing with a funding gap

Las Cumbres Observatory

University of St Andrews

prospects: increased demand once LSST is operational

goal: ***further grow*** user community

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keep supporting OPTICON transnational access scheme

widen user base and seek further funding in support

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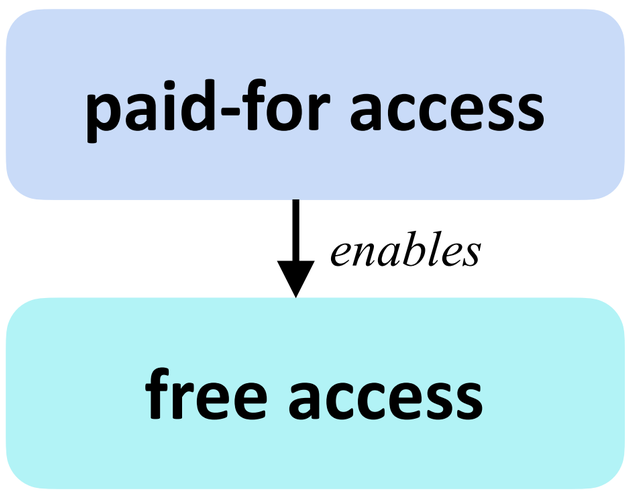

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paid-for access

↓ *enables*

free access

“Access for Africa”

paired with skills training programme

funding proposal specifically covering East Africa
(Kenya, Tanzania, Uganda, Rwanda)
submitted to STFC/UKRI