



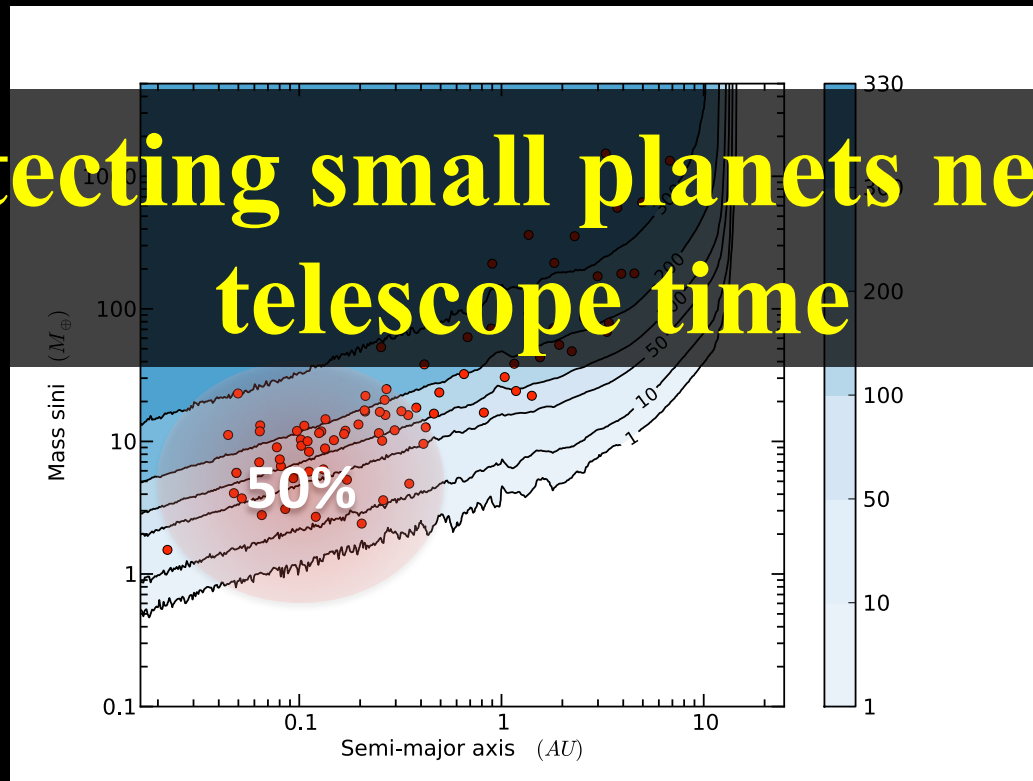
**Setting the stage for exoplanet  
atmosphere studies with  
NGTS and CHEOPS**

*Didier Queloz, Geneva, Cambridge*

# Super-Earths yield from HARPS program

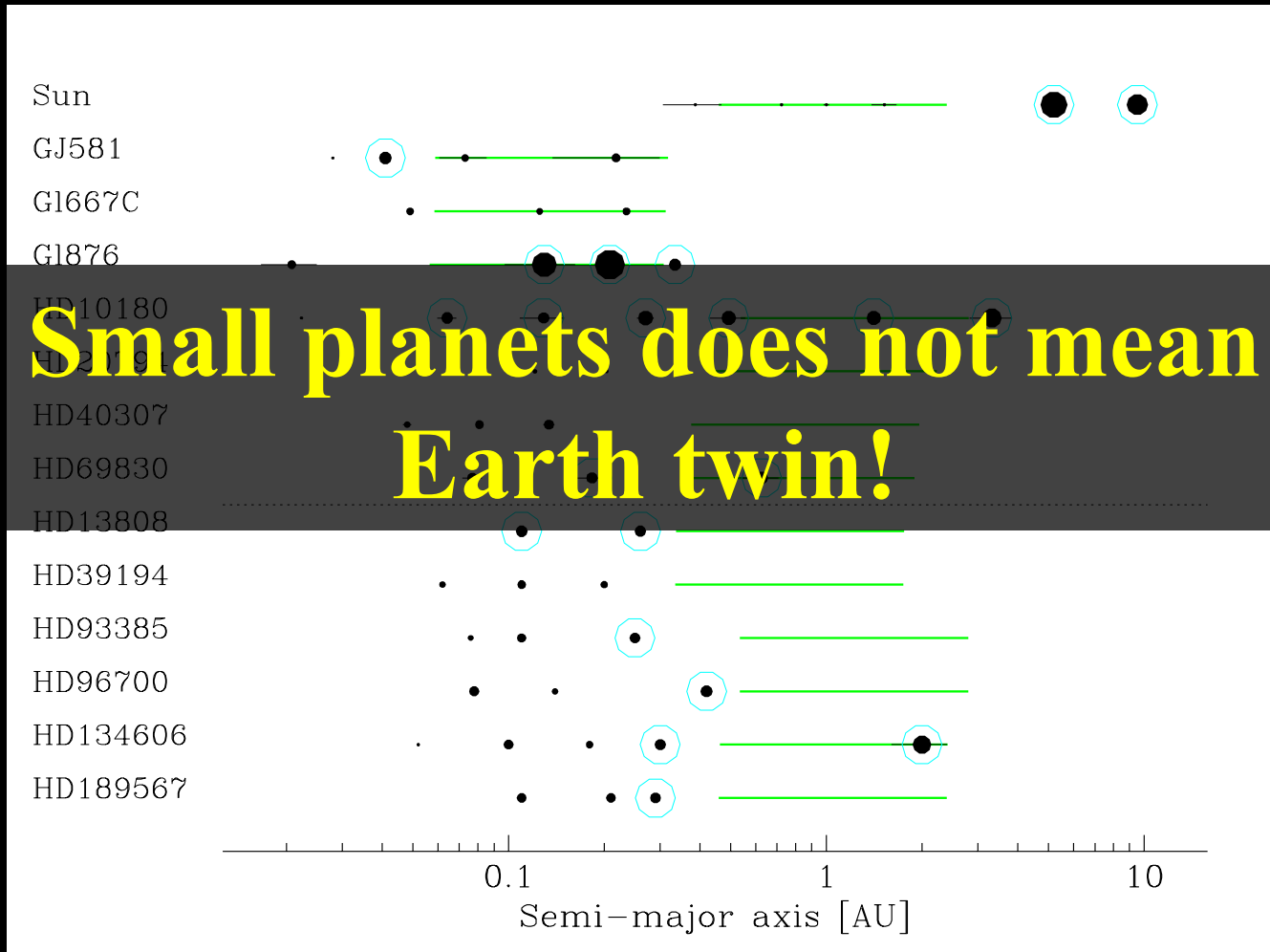
Above 500 nights, 300 stars, 8 years

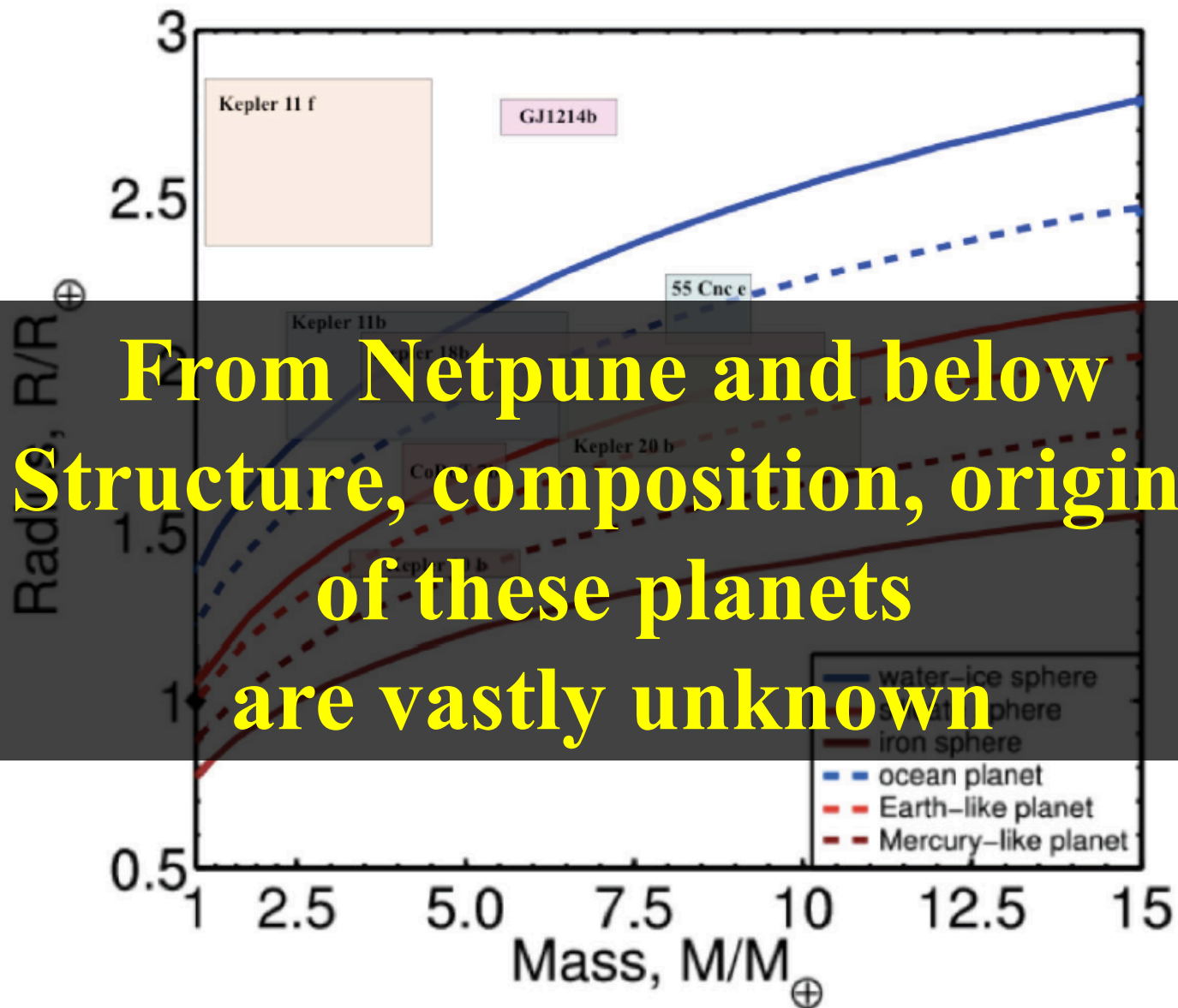
Detecting small planets needs  
telescope time



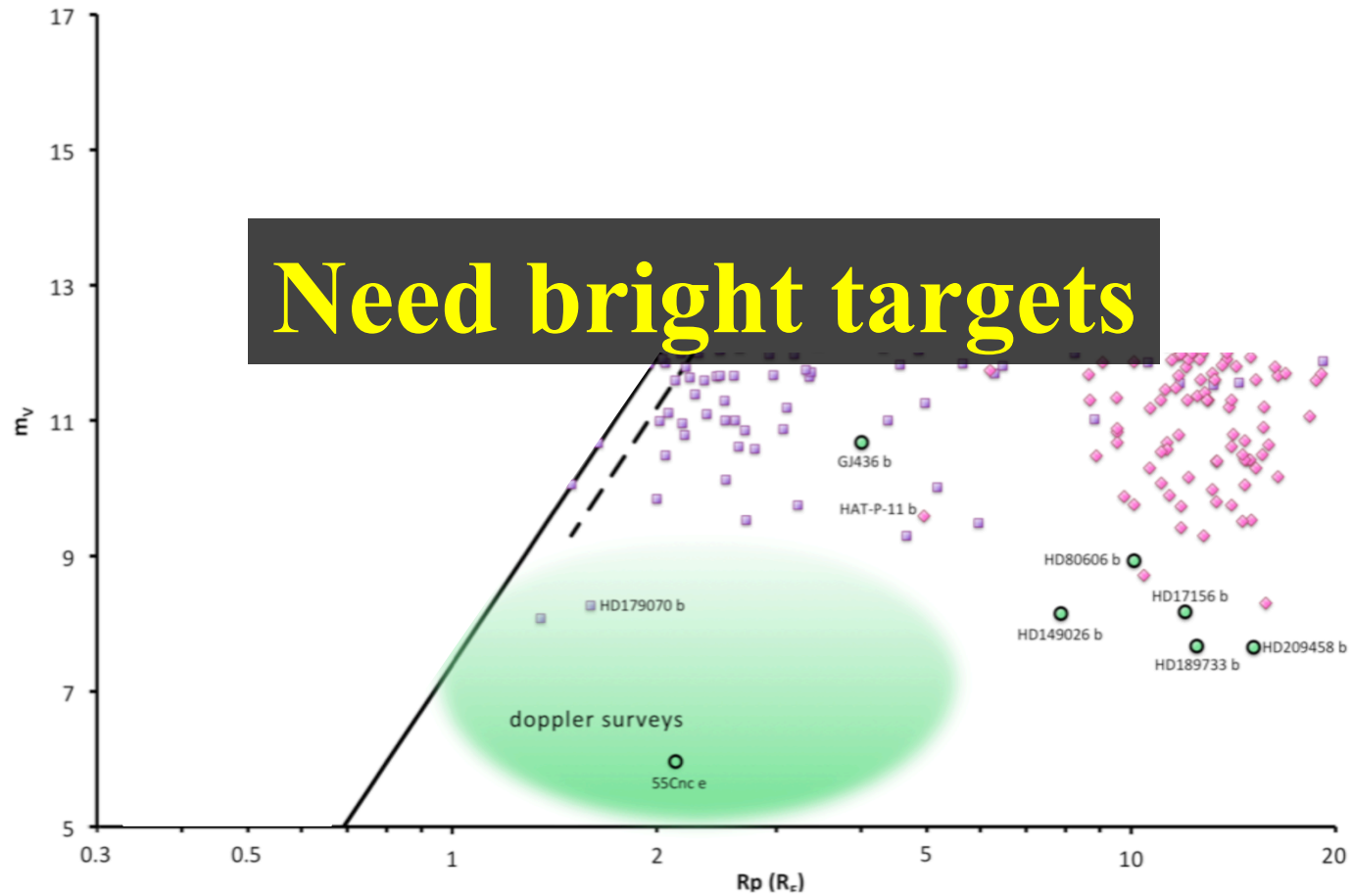
*Marmier private comm.*

# 13 planetary systems with at least 2 planets <15 Me

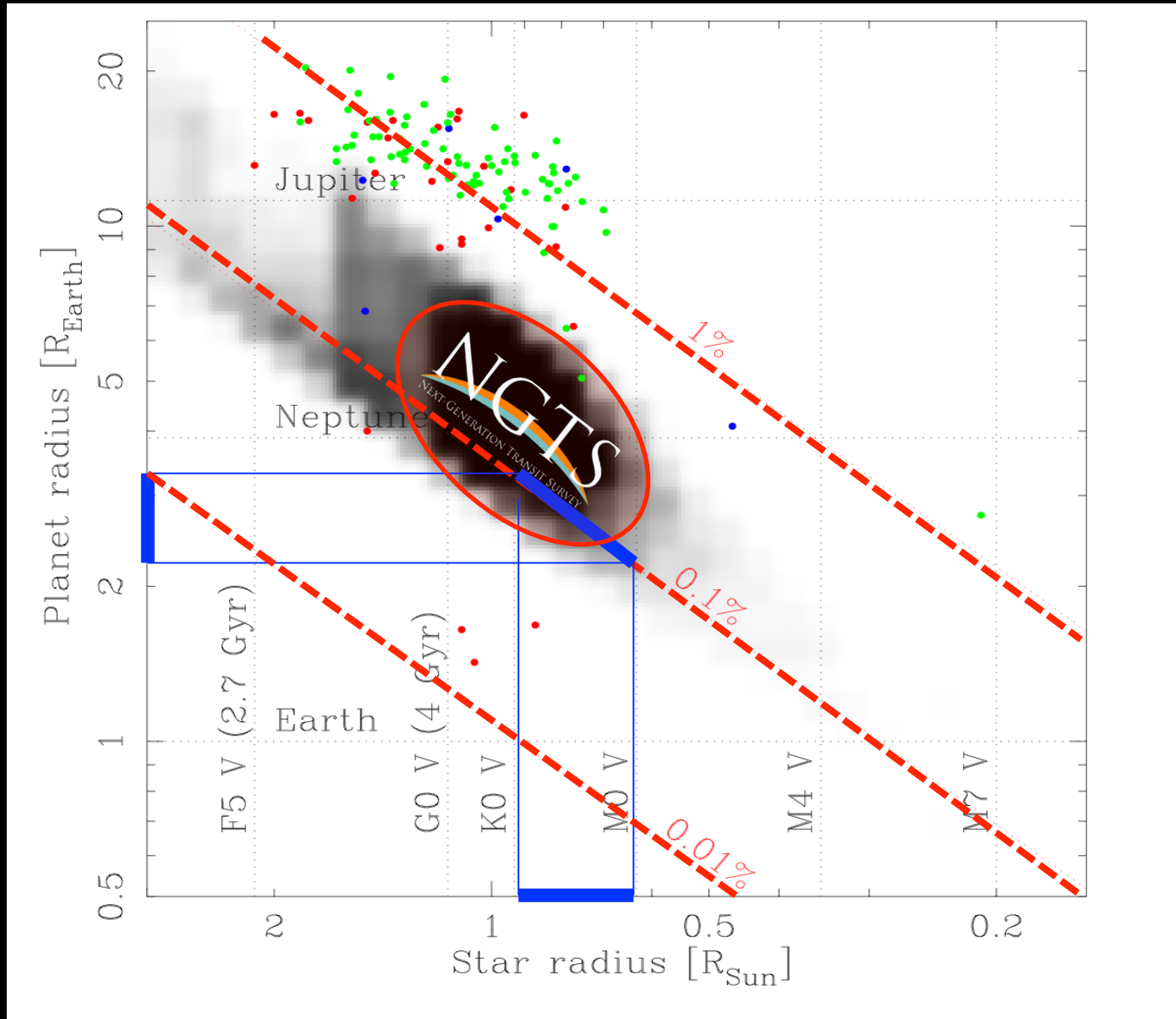


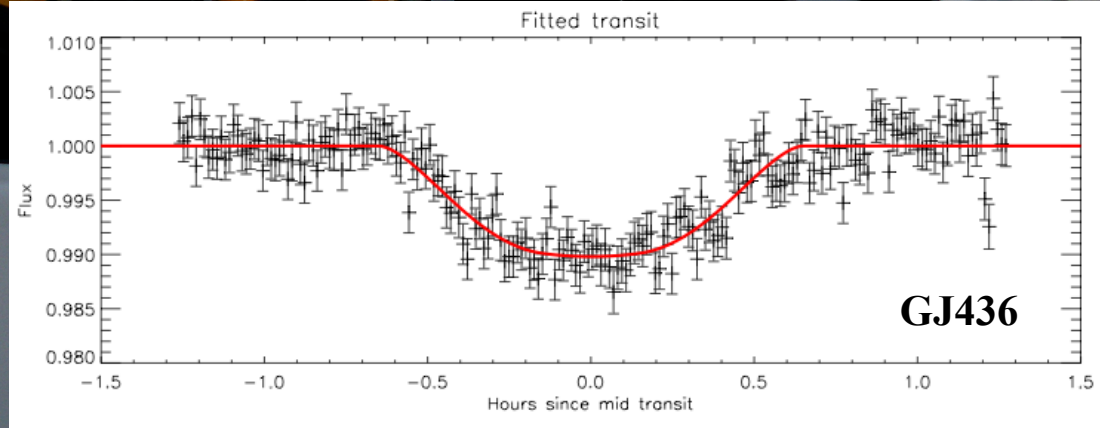
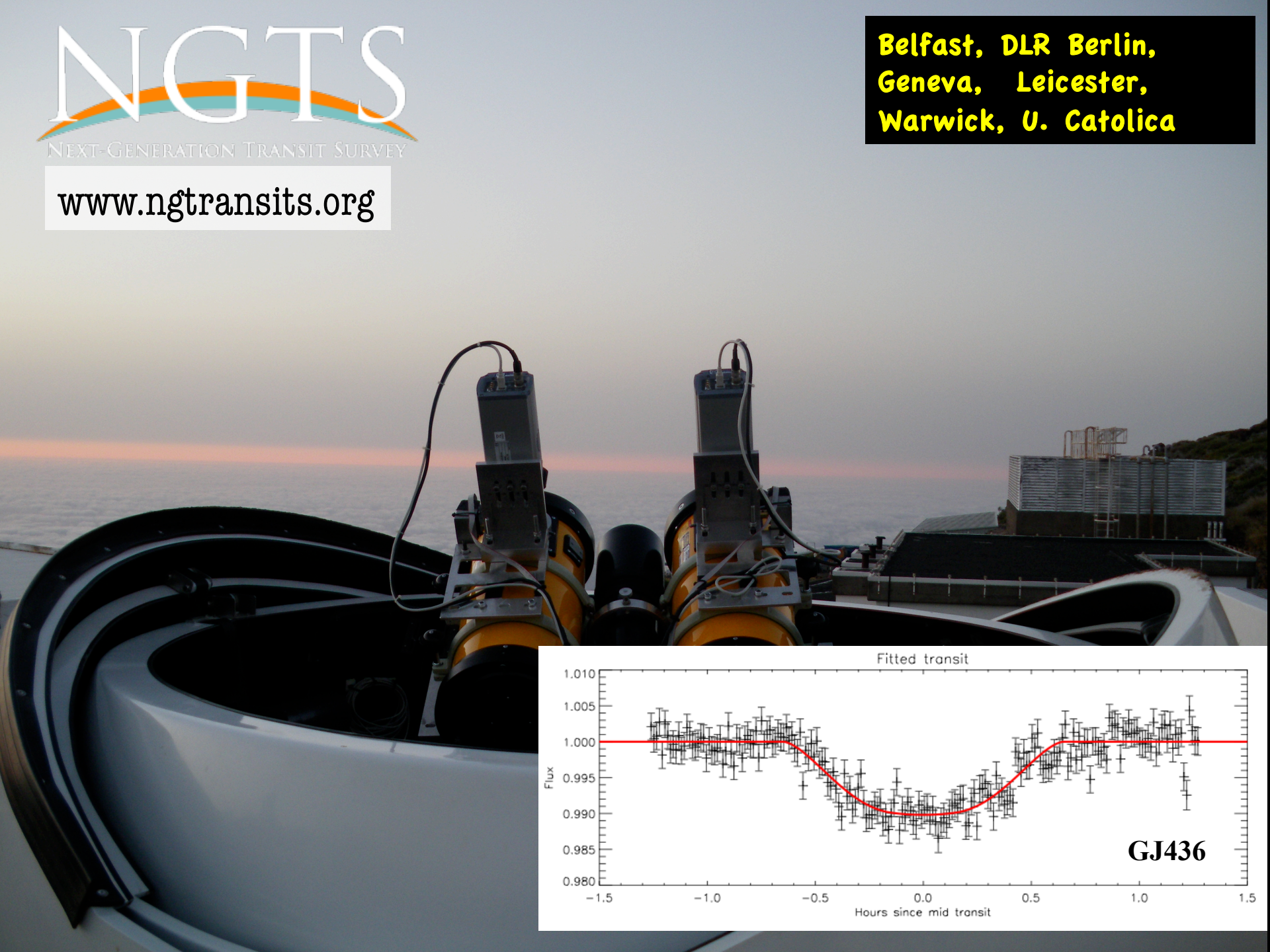


# Magnitude problem



# SEARCHING FOR BRIGHT TRANSITING NEPTUNES

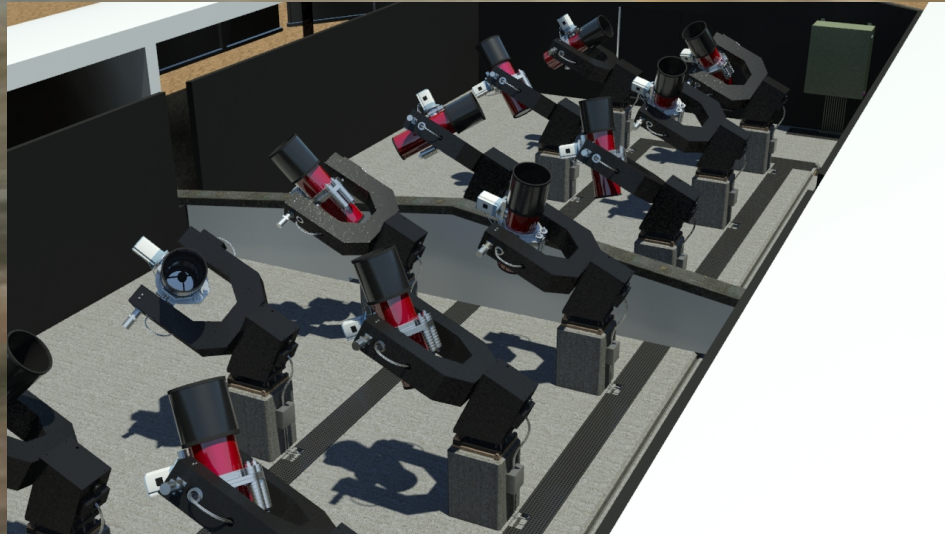




# NGTS

NEXT-GENERATION TRANSIT SURVEY

[www.ngtransits.org](http://www.ngtransits.org)

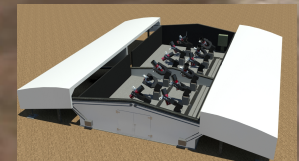


VLT+VLTI+VST

VISTA

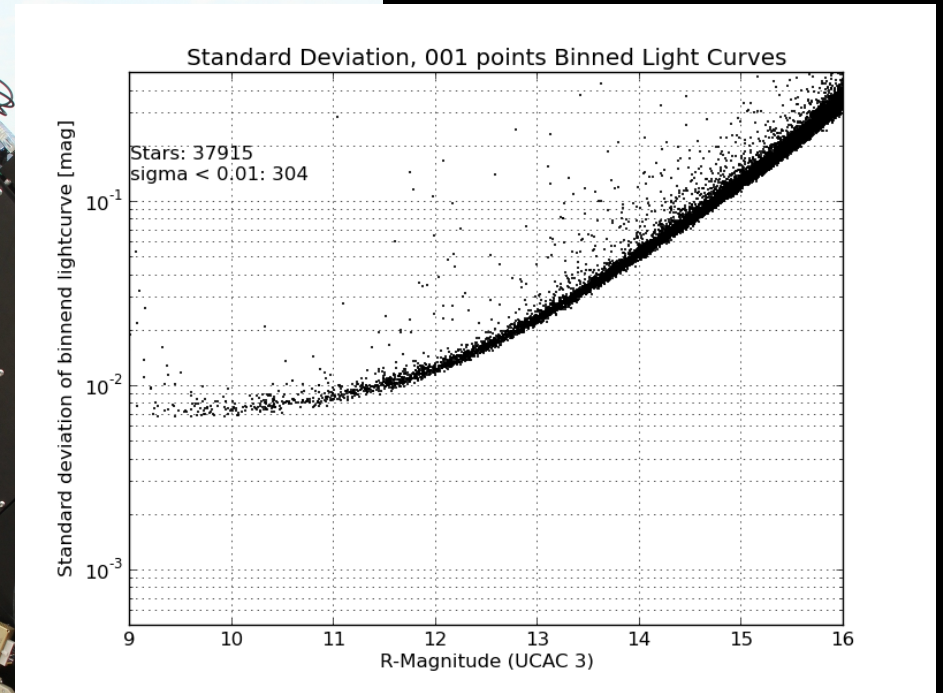
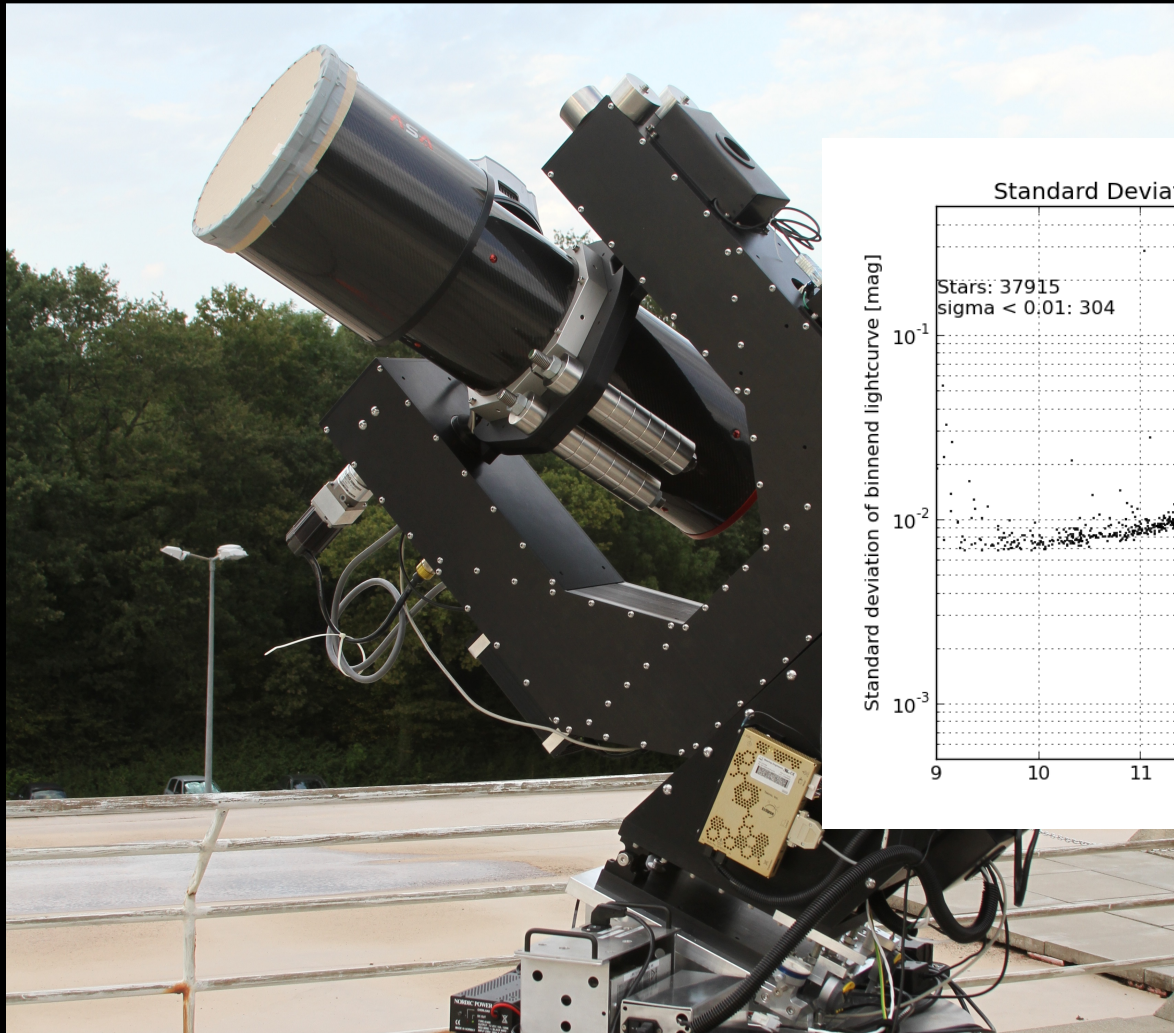
## Paranal residencia

Number of unit telescopes	12
Telescope	ASA 8 inch (200mm)
Telescope f/ratio	f/2.8, 560 mm focal length
CCD	e2v 2kx2k DD chip, Ikon-L by Andor
Pixel	13.5 micron
Pixel size	4.97 arcsec
Telescope FOV	8.00 square degrees
Mount type	OMI equatorial fork, 1 per telescope
Building dimension	12m x 15m (including a 3m wide parking)
Pointing limit	Airmass < 2
Total FoV	96 square degrees





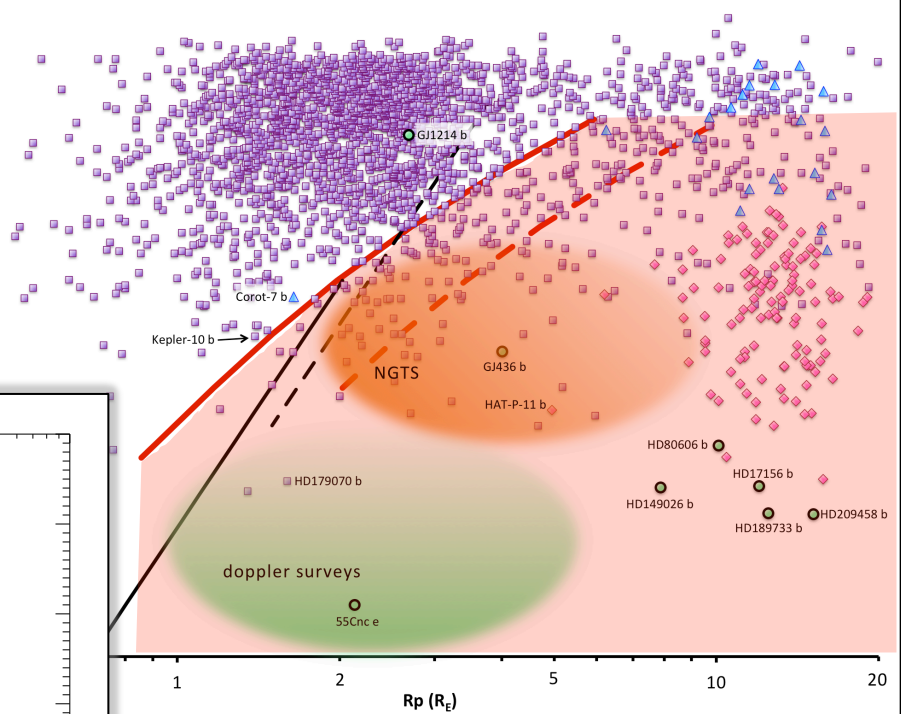
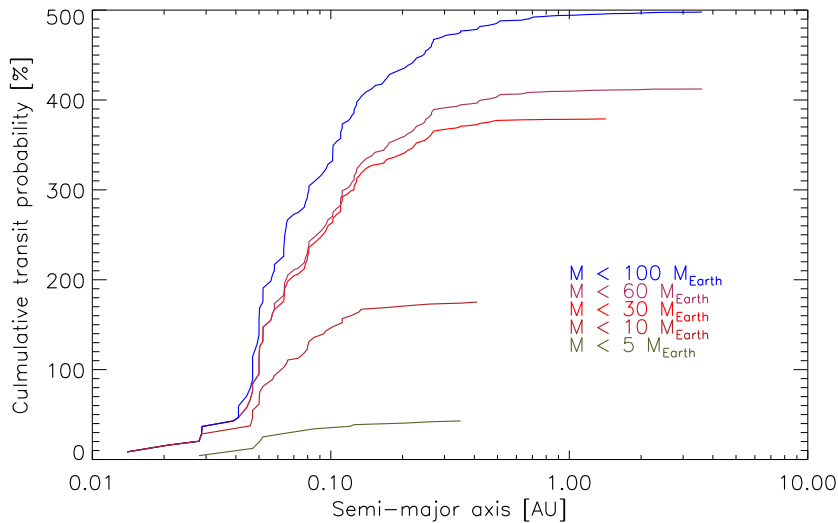
# First Unit being tested at Geneva



Radius:	R < 1.5 Re	1.5 Re < R < 4 Re	4 Re < R < 10 Re
V < 12	6	22	10
12 < V < 13	8	41	22
13 < V < 14	1	52	60

<http://cheops.unibe.ch/>

Selected ESA mission  
for launch in 2017



### CHEOPS, CHAracterizing ExOPlanet Satellite

Characterize transiting exoplanets on known bright and nearby host stars

Targets	Known exoplanet host stars with a V-magnitude < 12.5 (goal: 13) anywhere on the sky
Wavelength	Visible range : 400 to 1100 nm (Option: NIR to 1700 nm)
Telescope	33 cm reflective an-axis telescope
Orbit	Low Earth Sun-synchronous orbit 6am, altitude 800 km (Options: 1200 km altitude or modified GTO)
Lifetime	3.5 years
Type	S-class mission

50% vapor

10% vapor

Earth-like

CHEOPS

Radius

Mass

**NGTS: 2014-2019**  
hot Neptune in transit  
on 9 to 13<sup>th</sup> mag stars

**CHEOPS: 2018-2021**  
a pointed space photometric  
capability to search and characterize  
transiting exoplanets on bright stars

**GAIA: 2020**  
M nearby stars, Neptune planets

**TESS: 2018?**  
whole sky Neptune search

**PLATO: 2024?**  
search for Earth transiting planet  
on bright stars