Terra Hunting Experiment
HARPS-3 @ INT

- **How diverse are planetary systems?**
  *Our Solar system in perspectives*
  *Towards an universal model for planetary systems*

- **Is there life elsewhere?**
  *Understanding the origin, prevalence and nature of life in the Universe.*
Kepler, Eta Earth measurement...
Doppler search for planets

Planet RV

Stellar RV
HARPS-N solar telescope

Cameron et al. 2019
Our Sun as a star

A eclipsing binary star in Praesepe

HARPS-N CCF distortions

Relative flux vs. time (BJD - 2454833)

Relative flux vs. phase

Gillen et al 2017

Haywood et al 2018
Science Goal:
Detecting 1-4 Earth mass, with period from 50d to 300d on star brighter than 8.5\textsuperscript{th} (RV amplitude 10-100cm/s)

Accuracy Requirements:
• 48 hours calibration <10 cm/s (differential reference)
• Yearly “systematics” 20 cm/s (absolute reference)
• 30 cm/s photon noise per RV measurements (SN\textsubscript{r.e.}=300)

Survey model
(essentially based on R. Hall et al. 2019)
• Season Long uninterrupted “weather permit” nightly series of RV
• (never less than 4h/night, every day*)
• Season is between 6-9 months
• 150 RV/year x (up to 10 years)
• Stellar jitter “residual pink noise” less than 1m/s (peak-to-peak)

* Excl. Eng. nights
Uninterrupted nightly series is ING magic wand!