Planets around low-mass stars

Étienne Artigau, January 13th

The 2019+ horizon

- For <M4, Kepler+K2 we will have very good statistics
- To make a significant impact
  - Focus on a (very) small sample of Ms that is of particular interest
  - Focus on late Ms… and beyond
- TESS follow-ups may (will it?) take the lion's share of the GTO

The 2019+ horizon

- Focus on a small (<50) sample of very nearby objects (<5-7pc)
  - ~200 visits per star
    - ~10 000 visits, 40 visits/night, ~250 nights?
  - How many visits before we get diminishing returns?
  - Likely to have a true mass from GAIA
  - Important question : how much better would we do than existing HARPS M dwarf survey?
- Pave the way for the direct imaging with the E-ELT
  - 10µm, reflected light or à-la-Snellen detection
  - NIRPS is the only nIR PRV spectro in the same hemisphere as the E-ELT!
- Could stimulate instrumental development and/or justify otherwise prohibitively long integration

The 2019+ horizon

- Planets around L and T dwarfs
  - Seeing-limited mode only, most are way too faint in the optical for AO
  - P <12h or v sin(i) >10 km/s
  - R~40 000 is well matched to rotation in most cases
- Extend planet search all the way to the T dwarf regime (<10-70 M_{jup})
  - 99 L and T dwarfs south of 20° and J<14
    - Includes young objects, coolest is T6

The 2019+ horizon

- Earth on an Io-like orbit around a 30 M_{jup} L or T
  - 10 m/s, period ~8h
- Actual RV content of L and T dwarf is not known
- How does it compare with M dwarfs?
- How faint can we go to get 10-30 m/s per-visit accuracy?