Rocky Planets Around Cool Stars

M.Sc. Jesus Zendejas Dominguez
Currently PhD student at Max Planck Institute for Extraterrestrial Physics - RoPACS

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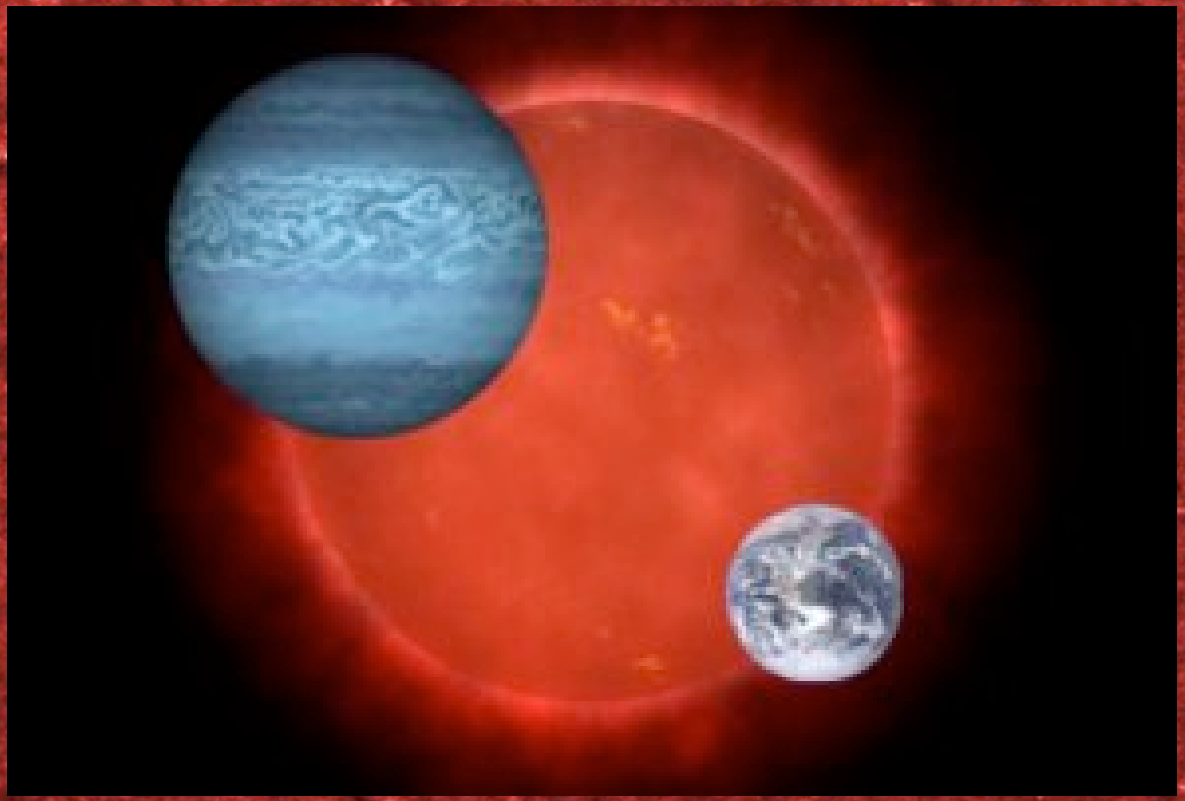
- Previous
- Ongoing
- Future



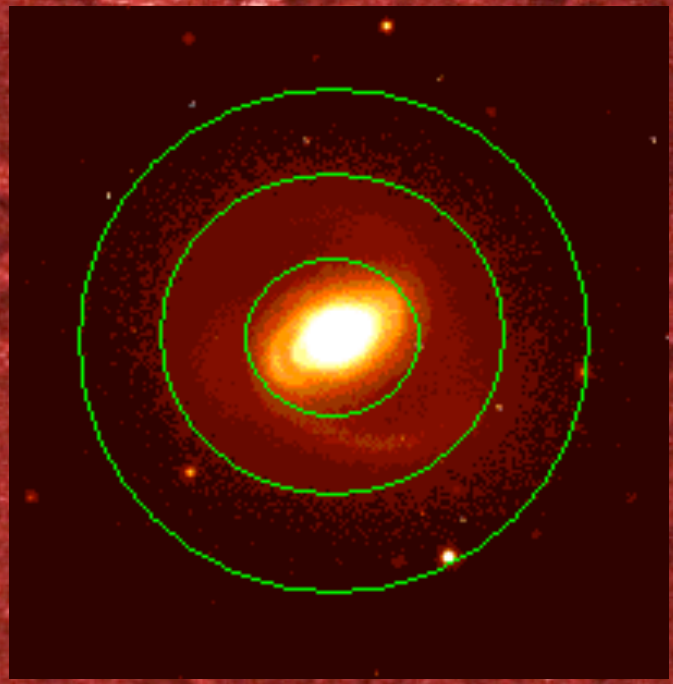
About my past…….

First steps as an Astronomer……

Thesis: BVRI Surface Photometry of Isolated Spiral Galaxies

Photometric properties:

- Apparent magnitudes
- Absolute Magnitude
- Colors B-V and B-I
- Structural parameters CAS



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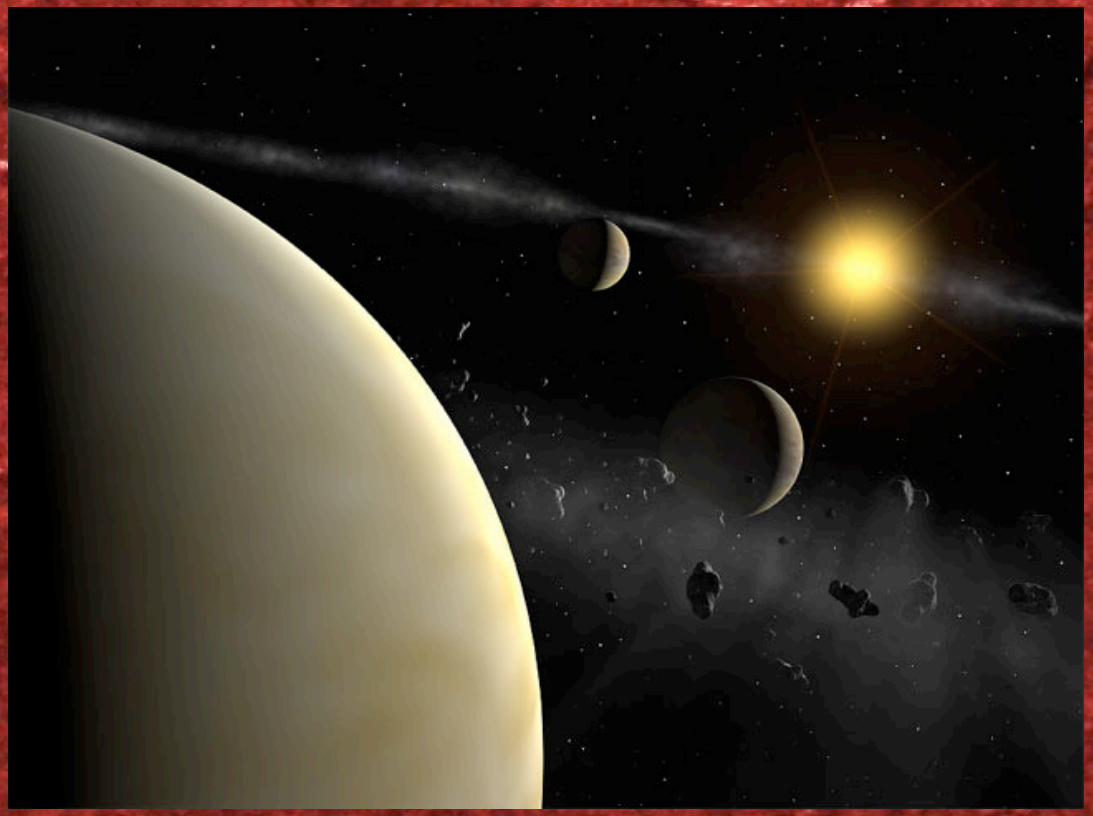
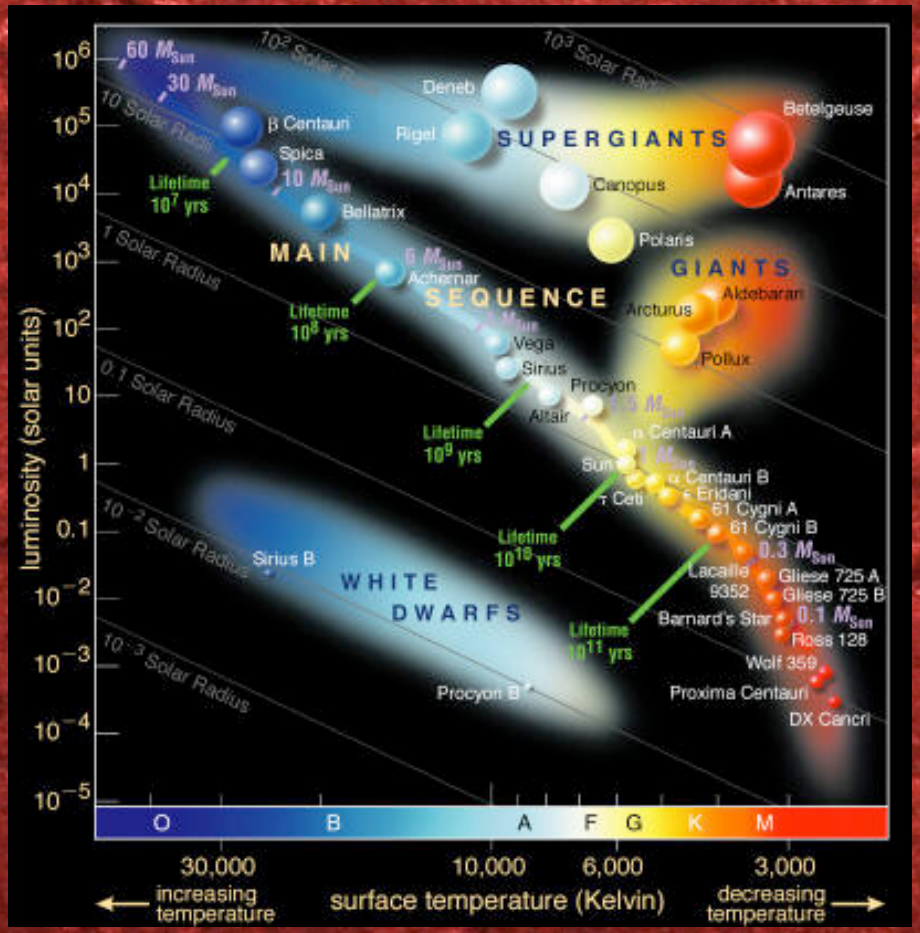
Master

Thesis: *Atmospheric mass loss by stellar winds ablation on planets around main sequence M stars*.



Astrobiology-New habitable worlds



- Mass 0.08 and 0.6 $M_{\odot}$
- Luminosities: 10^{-1} - $10^{-3} L_{\odot}$
- Main sequence life time ~10^{11}yrs
- 75 % population

(Tarter et al. 2007)

The habitable zone for a M dwarf:

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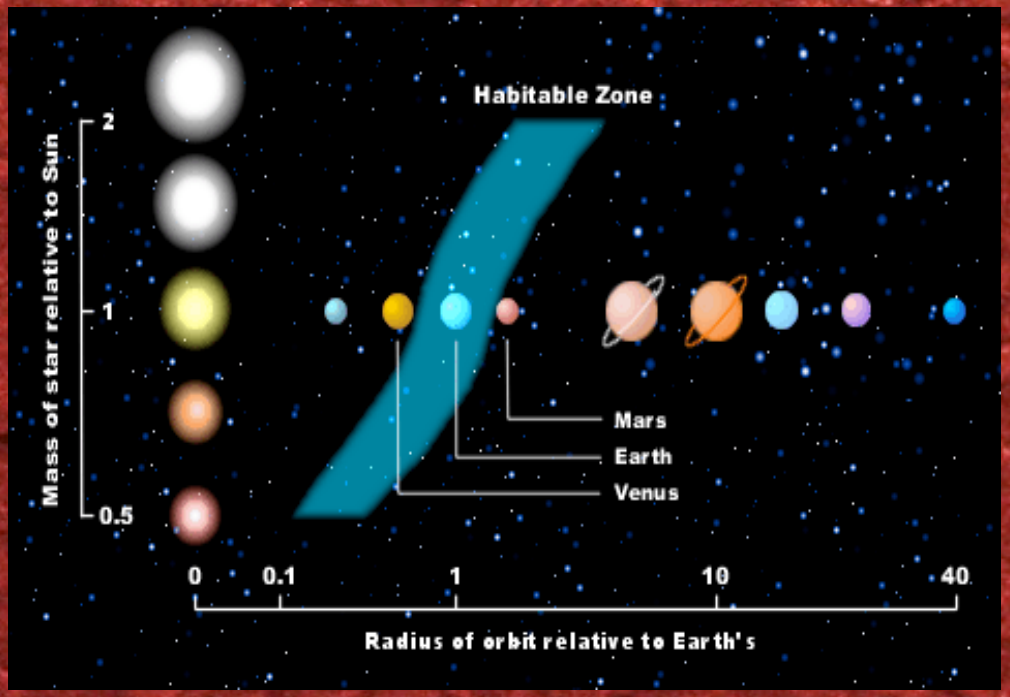
d ≈ 0.2 UA



Disadvantages
"Tidally locked planets"- Freezing the dark zone of the planet.
Strong outflows of UV radiation coming from the chromospheric activity.
High X-ray emission, coronal mass ejections and stellar winds.

Main goal:

Considering that the presence of an atmosphere on a planet is crucial to consider it as habitable world. I estimated the time-scale which the planet would lose completely its atmosphere due to the interaction with stellar winds using a mixing-layer model for stellar flows.

Ongoing work....

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Transit method…..

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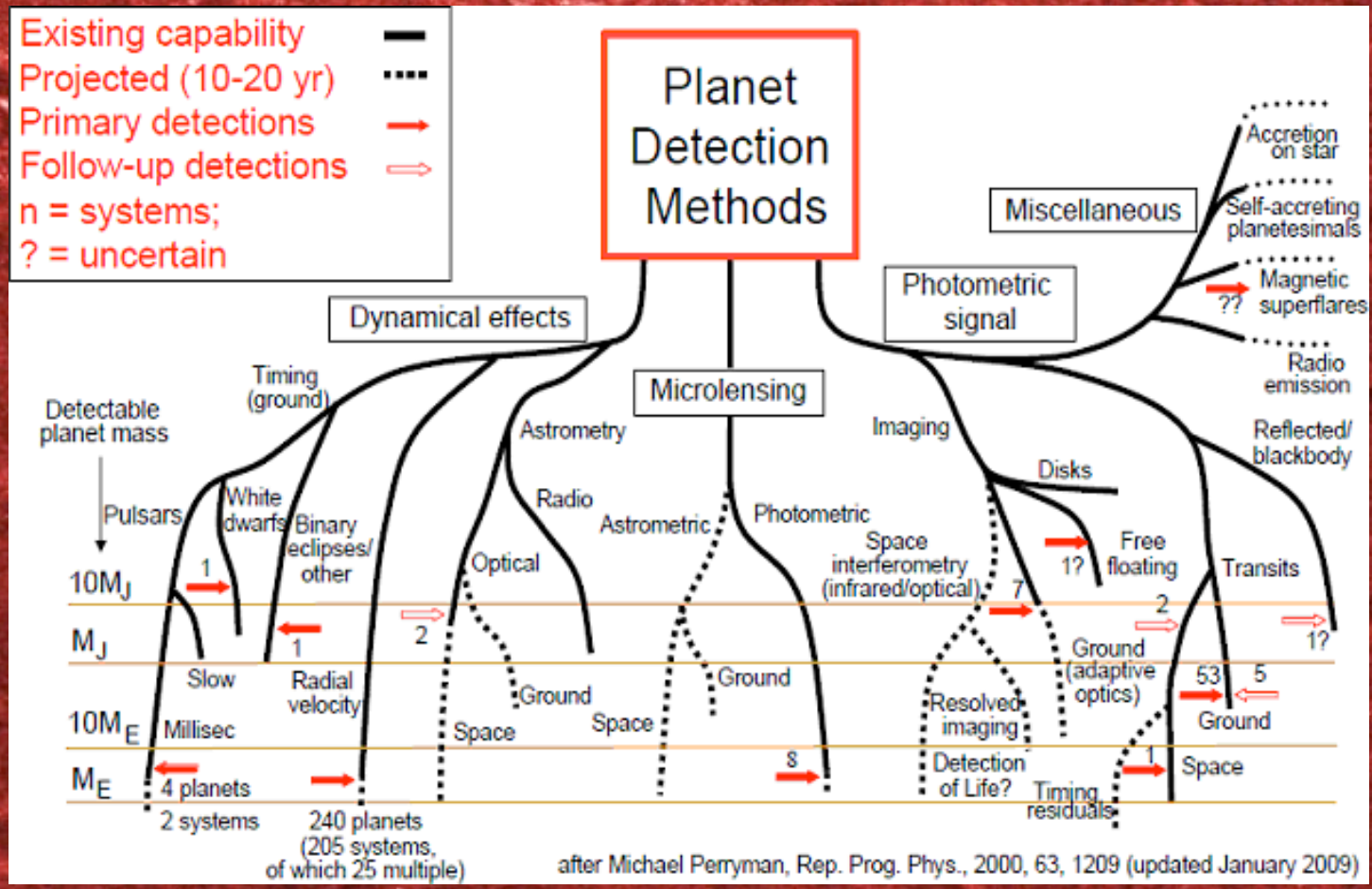

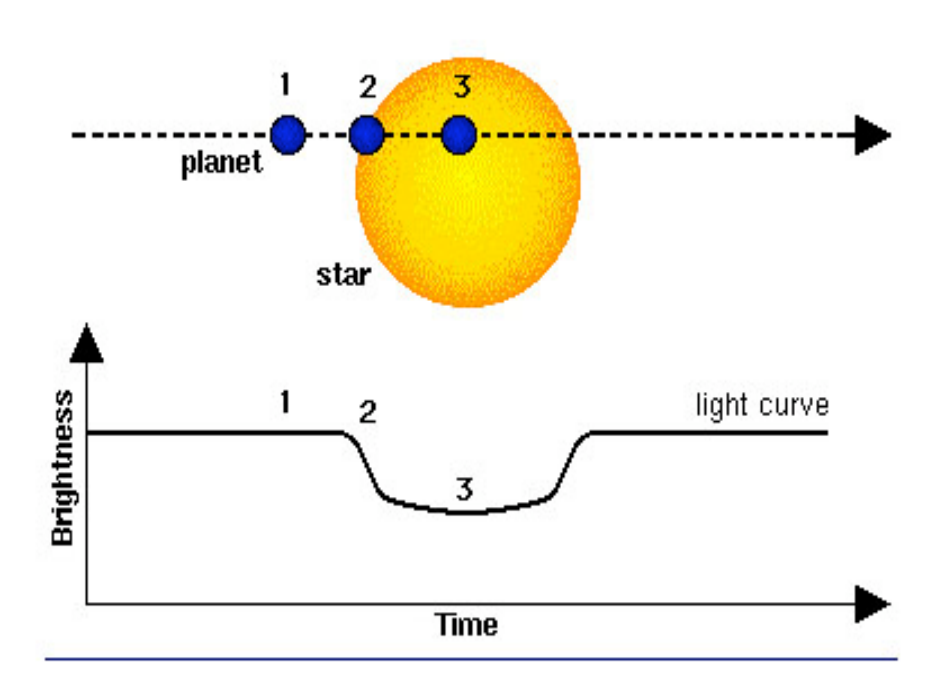

Analyzing lightcurves from WF-Camera Transit Survey (WTS), using the box-fitting algorithm (Kovács et al. 2002) to detect new candidates.

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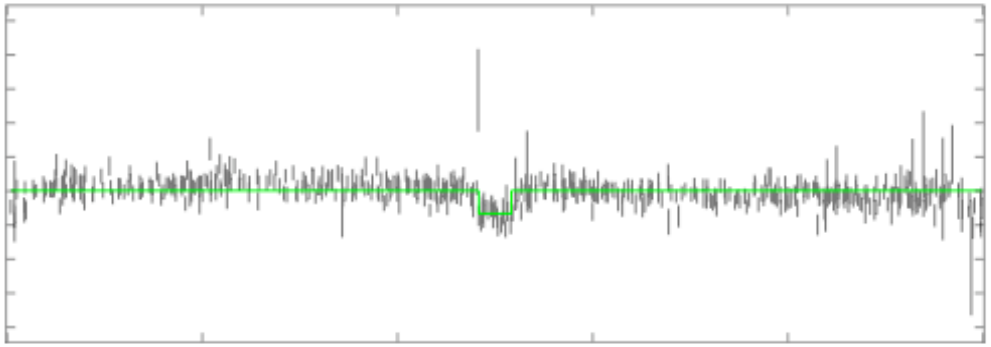
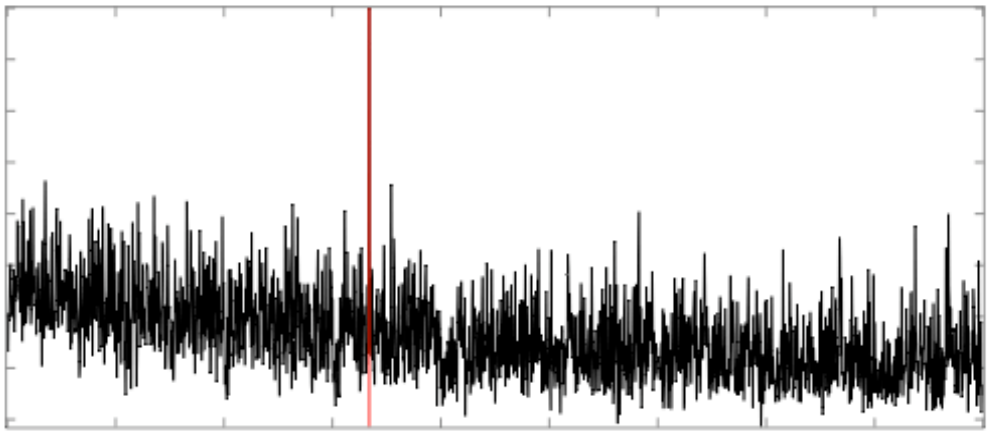
No. : 3655 R = 8.71 SDE = 9.796 p = 1.152 tau = 0.03372 drop = 0.06699



phase



1/p [1/d]

Future work……

- I will be still analyzing the actual and new light curves from WTS (difference imaging…) and using computational algorithms to search and identify new candidates.

- A visit to Cambridge in the very near future would be nice to learn more about this field.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Thank you very much for your Attention!