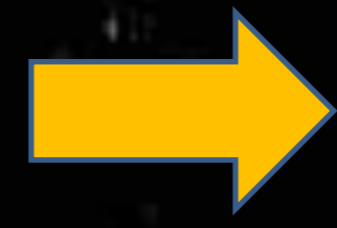


# SEARCHING FOR LIFE FINGERPRINTS IN THE LABORATORY

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## Timeline of the experiment

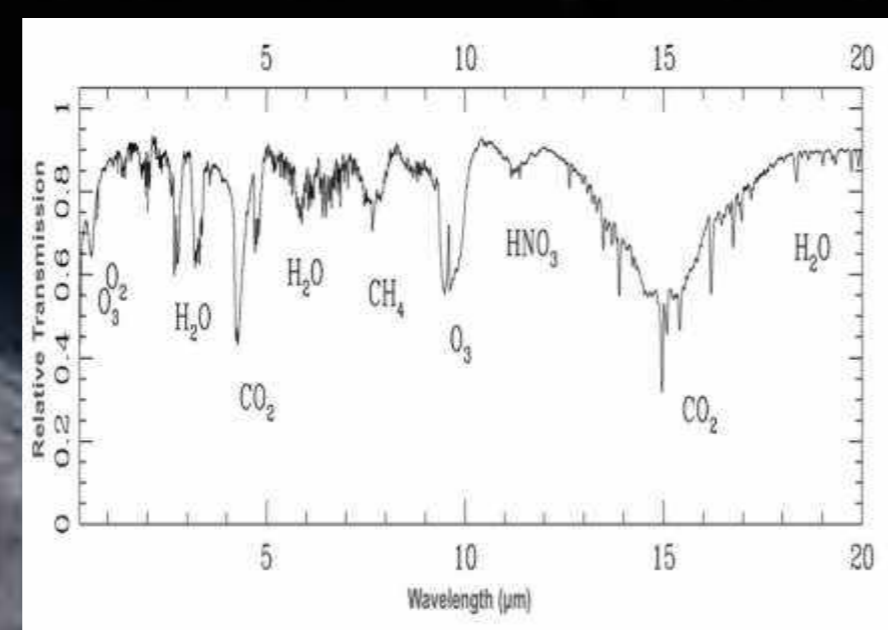
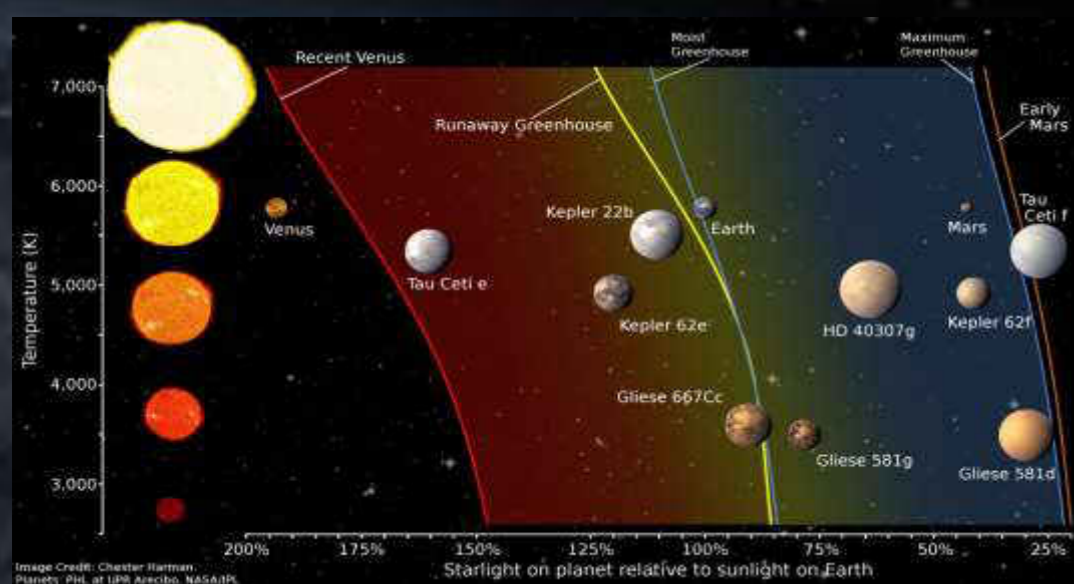
• First step- hardware setup: measurements of pressure tightness of the cells, development of a starlight simulator



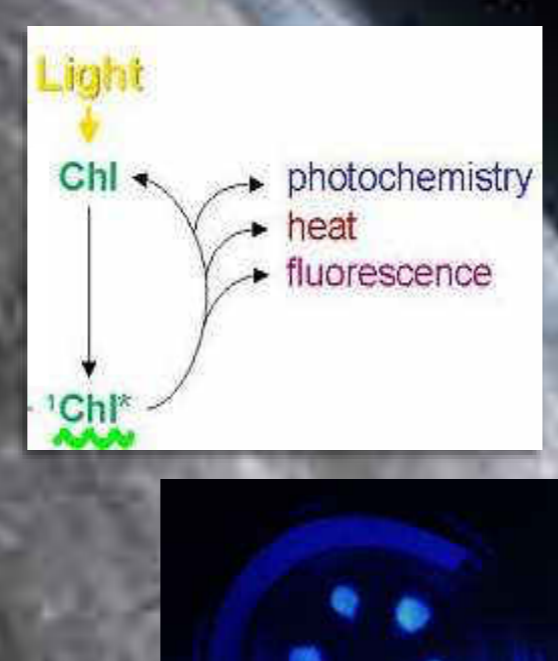
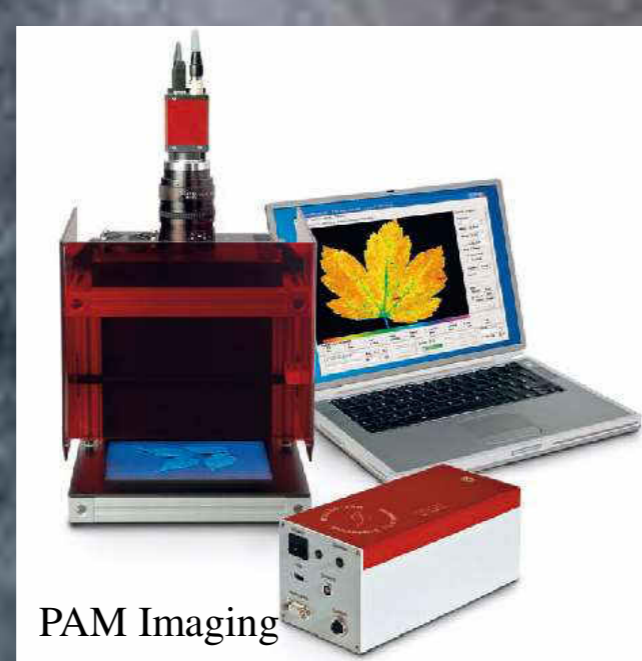
• Second step: Irradiation of the samples with most friendly conditions  
Analysis of gaseous abundances in the cells



• Third step: Irradiation of the samples with a stellar spectrum and terrestrial pressure, temperature and gaseous mixture and analysis of gaseous abundances in the cells



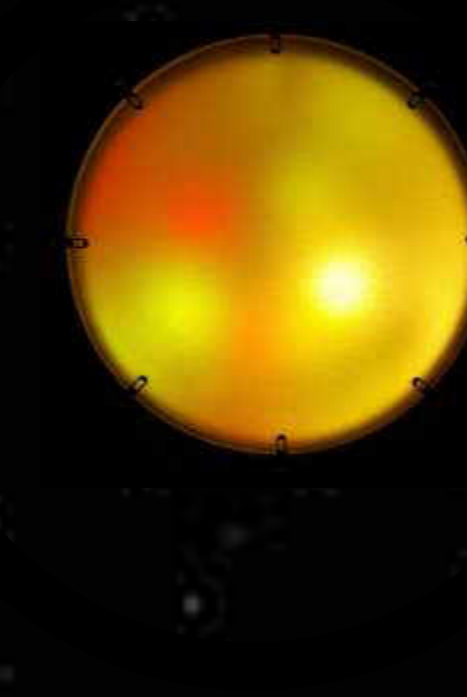
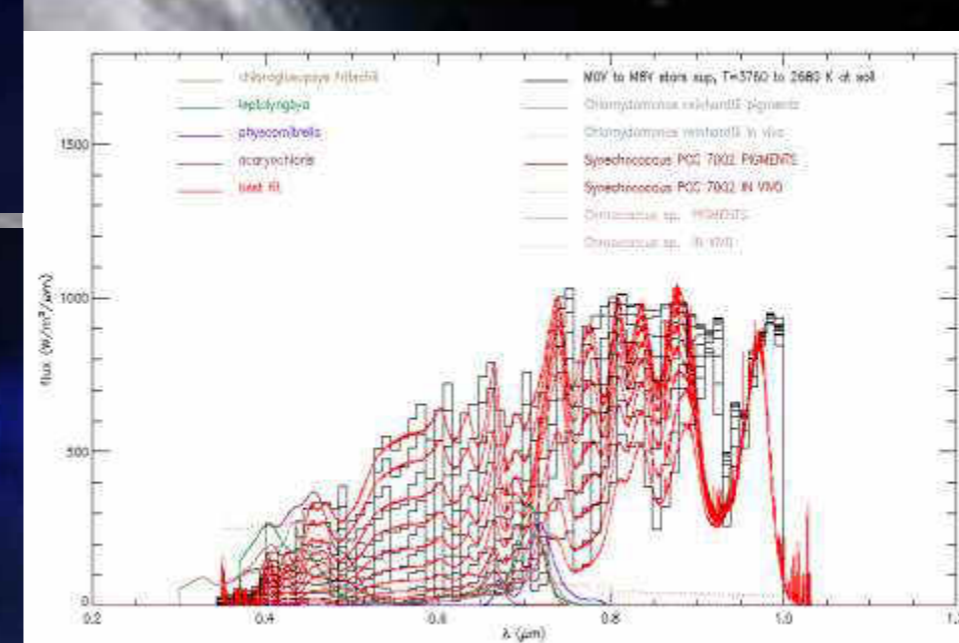
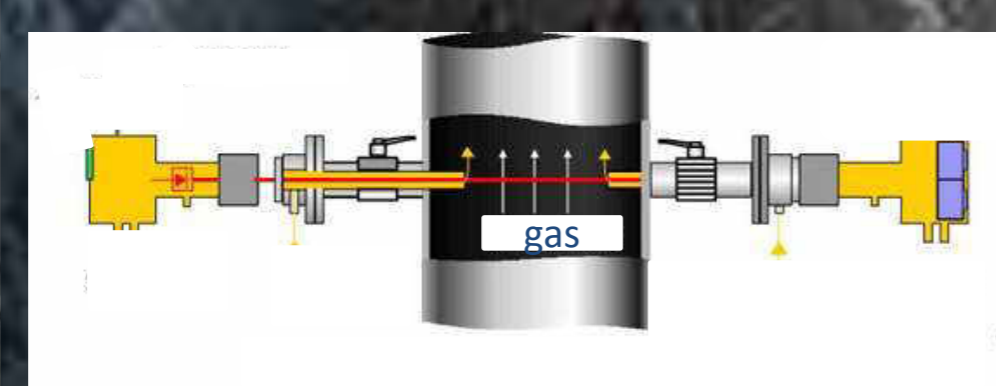
## The Hardware



F0 star  
T=7250 K  
Moist Greenhouse distance



G0 star  
T=5900 K  
Moist Greenhouse distance



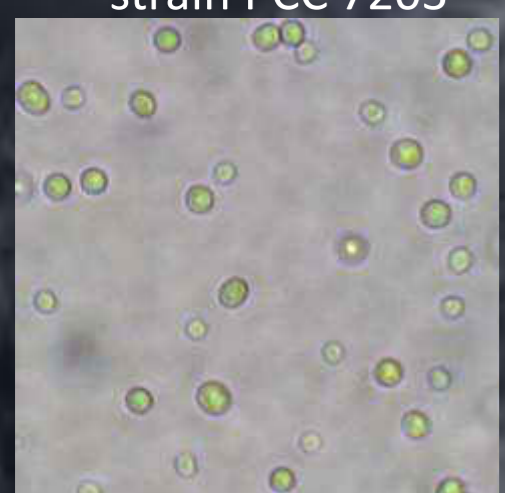
M0 star  
T=3760 K  
Moist Greenhouse distance



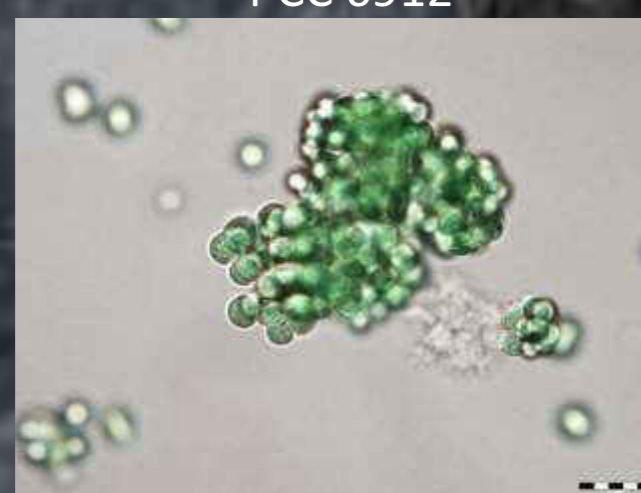
M8 star  
T=2700 K  
Moist Greenhouse distance

## The samples

*Chroococcidiopsis Thermalis* strain PCC 7203



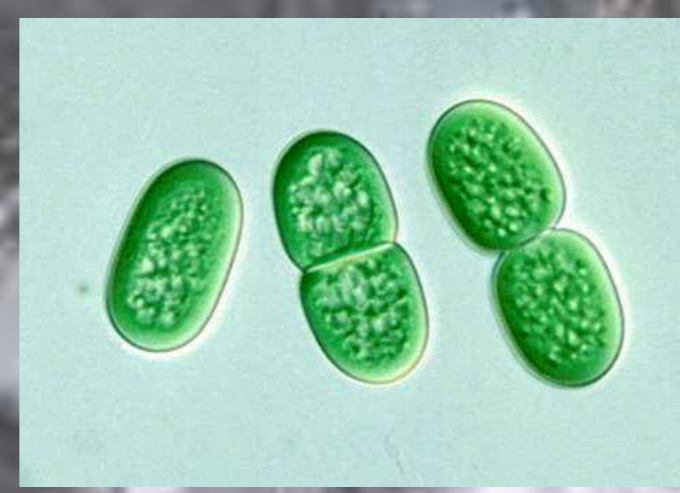
*Chlorogloeopsis fritschii* PCC 6912



*Cyanobacterium aponinum* strain PCC 10605



*Synechococcus sp.* PCC 7335



*Physcomitrella patens*



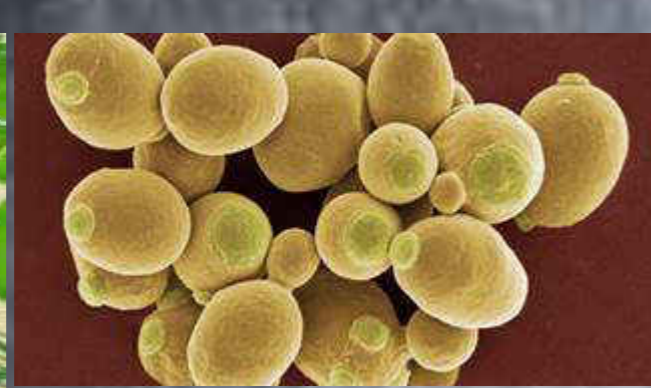
Sensitive to the IR and NIR radiation  
Photosynthetically active in low light conditions  
No day-night cycle: continuous irradiation

## Other uses

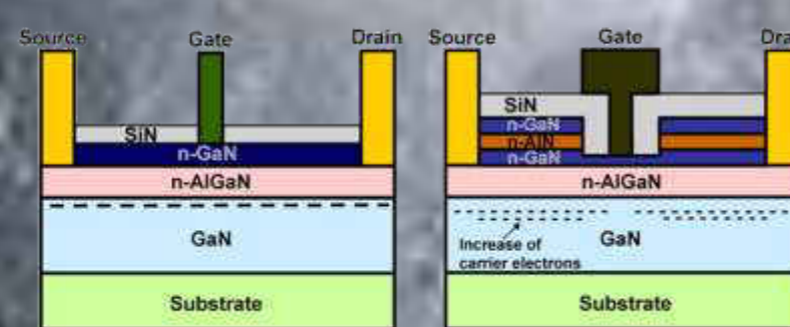
Photobioreactor wavelength test bench



Yeasts growth



GaN HEMTs transistor



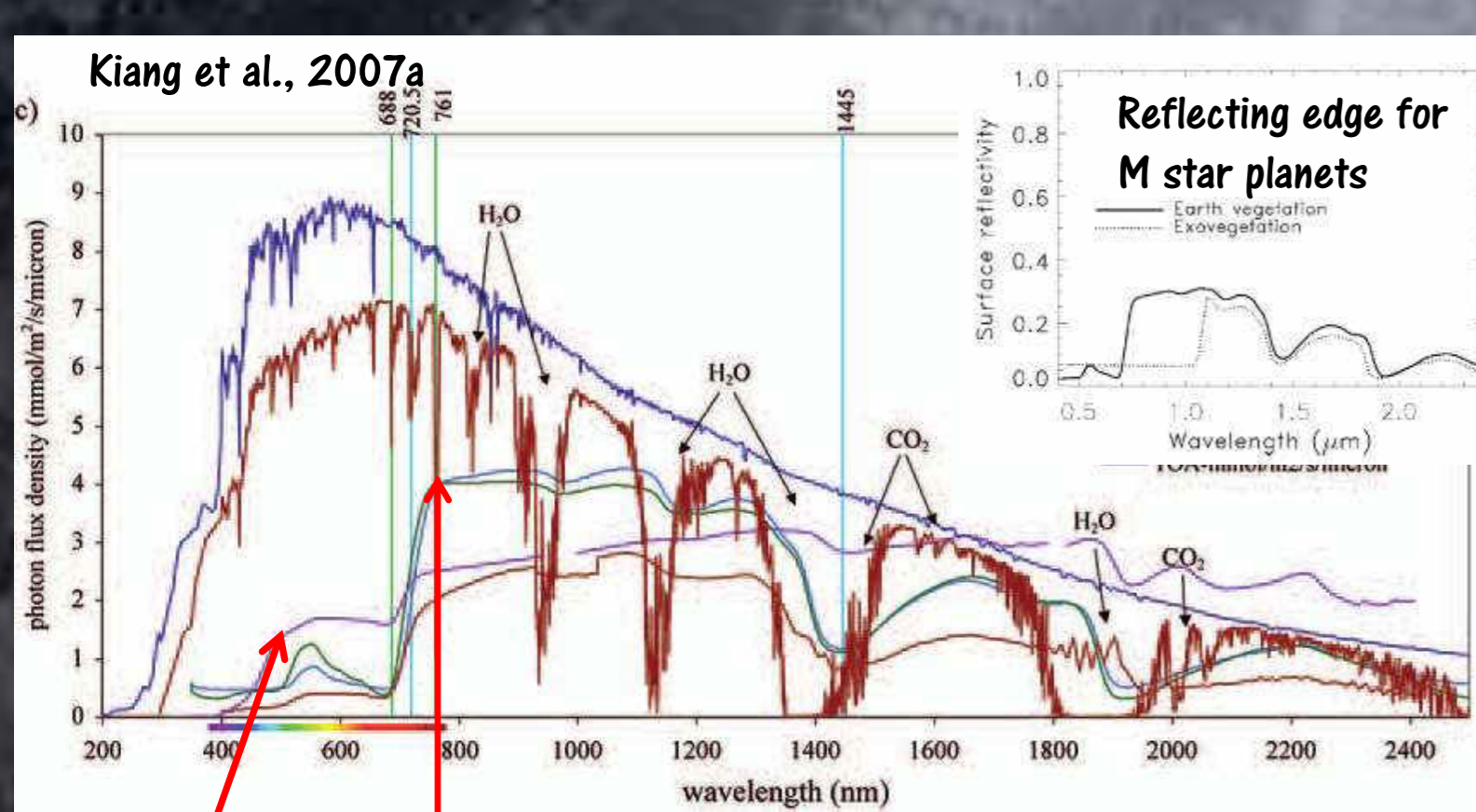
An app for fun and not



Different colors in different worlds  
P, T and airmass setting  
Star radiation setting

## Educational outputs

- 1) For university the stellar simulator could represent a new facility for the next experiments, especially for multi-field studies.
- 2) A radio podcast is under study to reach a wider slice of people. It has been thought as a sort of "pills", a short time space inside which treat an argument of life outside the solar system.
- 3) Lessons for students could be made with the outputs of this research. For the target 8 and 17 years could be made experiments with shadows.



Green bump  
Red edge varied depending on the organism type, biomass, hydration and leaf thickness and carbon content

