

# AST251 Project 3 – Evaluating Claims of Extraterrestrial Messaging

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## Planet 3

Monday 31<sup>st</sup> May, 2088

**We have identified what may be an indication of extraterrestrial intelligence, as well as the planet where it may have originated. This document summarizes the information gathered so far about the candidate message and its candidate planet of origin.**

### Potential evidence for extraterrestrial intelligence

Astronomers have detected a narrowband optical transmission that appears to have originated from this planet’s solar system. The transmission is believed to contain an image and is displayed below with the most likely aspect ratio. The transmission has been observed to repeat itself regularly. The transmission is shown below:

```
101000000000000000000000000000001110111101111101111110111111100000000101
1010101111111101111111101011111110111011110111110111111011111101111110101
10100000000000011111111011011111110111011110111110111111011111101111110101
10100000000000011111111011101111110000011110111110111111011111101111110101
101000000000000111111110111011111100000000000000011111011111101111110101
1010000000000001111111101111101111000000000000000000001111101111110101
1010000000000001111111101111101111000000000000000000000000000000000000111110101
1010000000000001111111101111110110000000000000000000000000000000000000111110101
1010000000000001111111101111111011000000000000000000000000000000000000111110101
101000000000000000000000000000000000000000000000000000000000000000000101
```

This signal was first noticed at UTC 2082-06-09/22:02.

### Parameters of the candidate planet of origin and its host star

Spectral Type	K
Stellar Luminosity (Solar Units)	0.0808
Stellar Mass (Solar Masses)	0.533
Distance to Star (lightyears)	701.4
Planet Mass (Earth masses)	4.1
Atmospheric Pressure (atm)	9.4

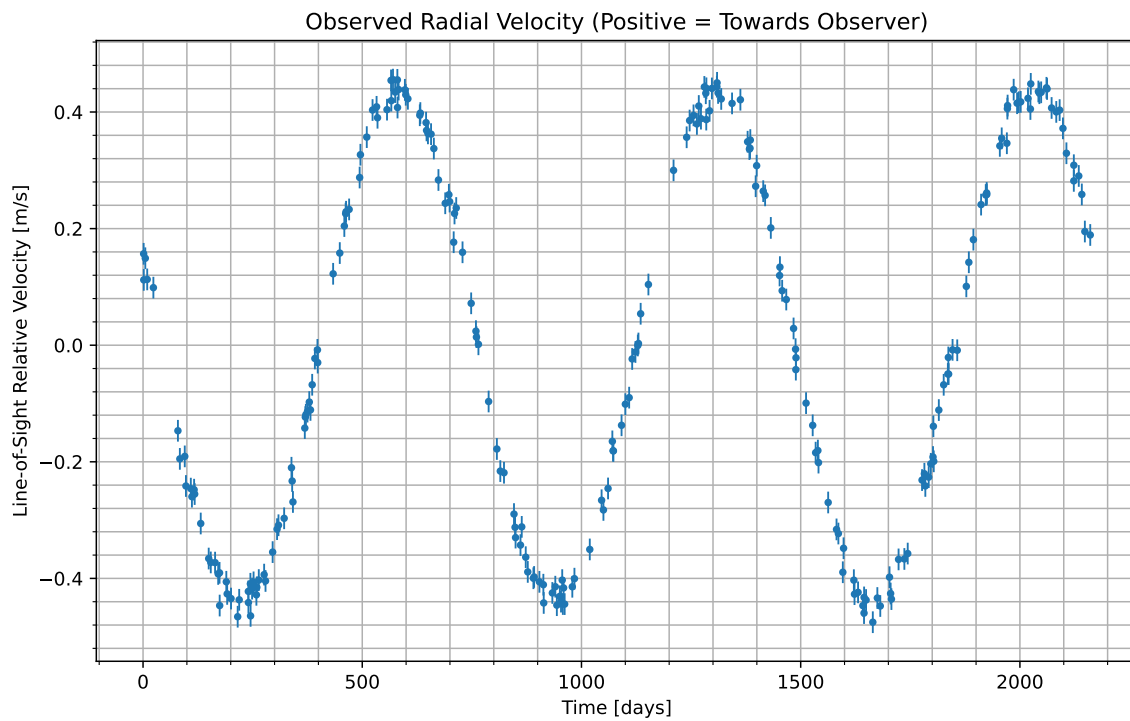


Figure 1: We have isolated the radial velocity of the host star due to the candidate planet. Data begins at UTC 2082-06-12/06:15. Positive values indicate the velocity at which the star is moving towards us; negative indicate the velocity at which it is moving away.

### Atmospheric composition of the candidate planet (percent by volume)

Molecule	Concentration
$H_2S$	46.7
$N_2$	17.7
$CO_2$	4.53
$SO$	8.81
$SO_2$	2.92
$HF$	0.223
$CO$	12.5
$S_2O$	3.85E-06
$S_2O_2$	0.000144

## Gas Abundance (percent by volume)

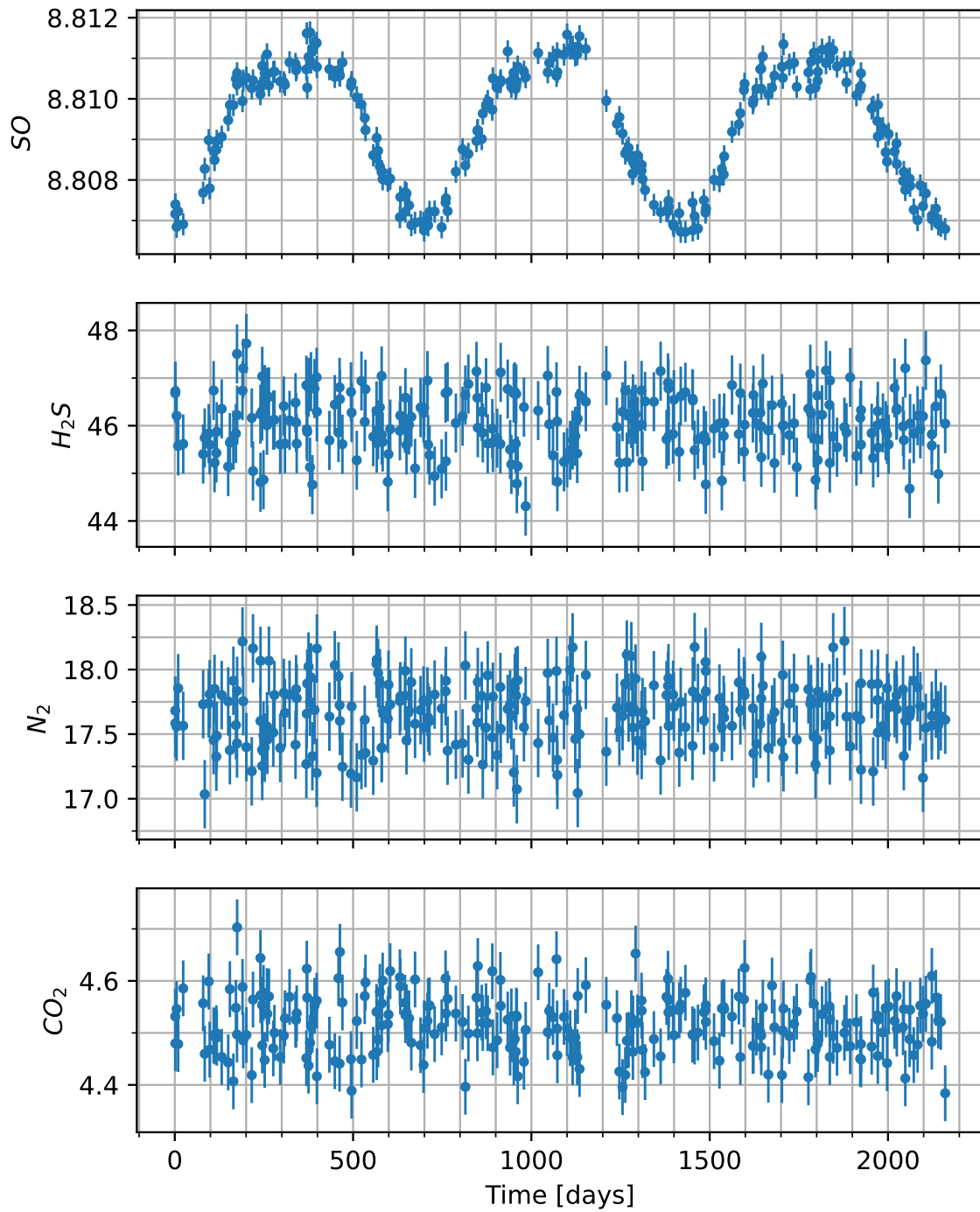


Figure 2: Concentration of various gases in the atmosphere of the candidate planet versus time. Note that the y-axis will usually only show the variation multiplied by some factor, shown in the upper left, and then added to some normal amount, also in the upper-left.

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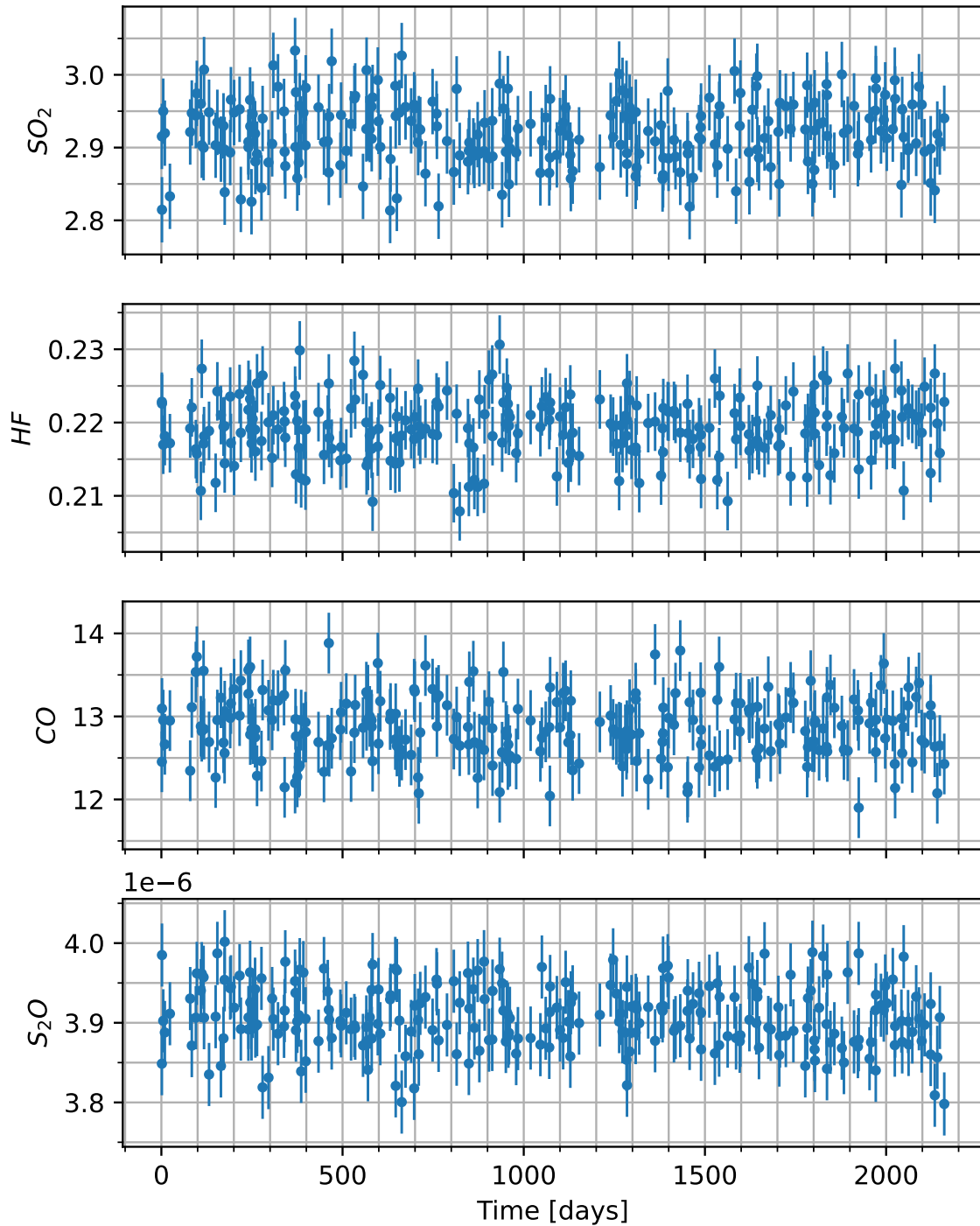


Figure 3: Concentration of various additional gases in the atmosphere of the candidate planet versus time. Note that the y-axis will usually only show the variation multiplied by some factor, shown in the upper left, and then added to some normal amount, also in the upper-left.

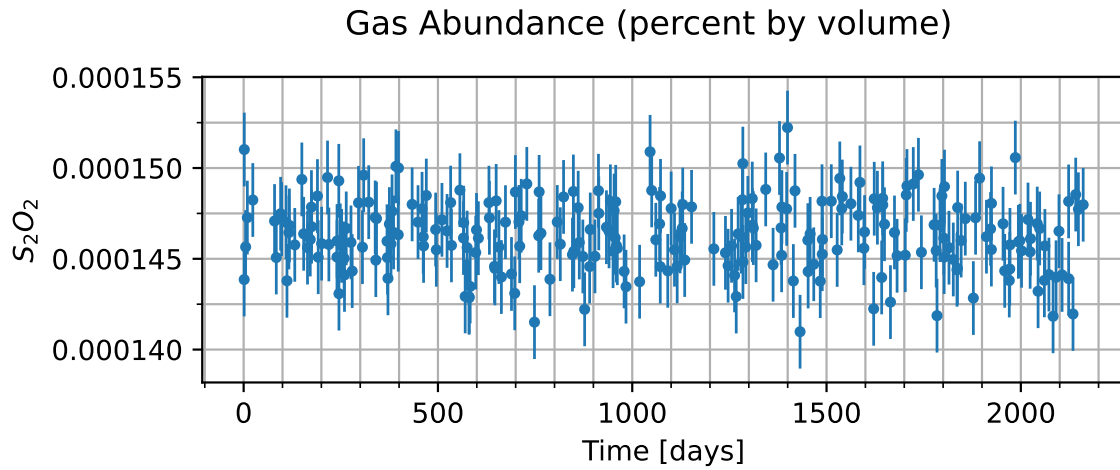


Figure 4: Concentration of various additional gases in the atmosphere of the candidate planet versus time. Note that the y-axis will usually only show the variation multiplied by some factor, shown in the upper left, and then added to some normal amount, also in the upper-left.

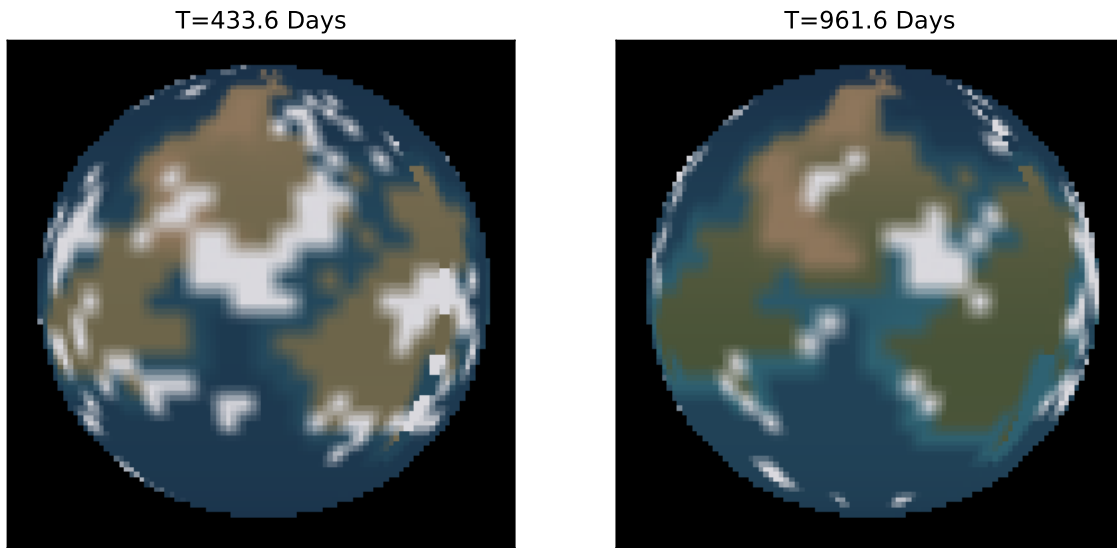


Figure 5: Maps of the surface of the candidate planet taken at two different times. Times are indicated above each image relative to the times shown in the radial velocity curve. Those maps are shown here. Tan areas indicate what we believe to be land, while blue-ish areas indicate what we believe to be liquid regions of some kind. Other colors present reflect the visible color as best as we are able to measure.