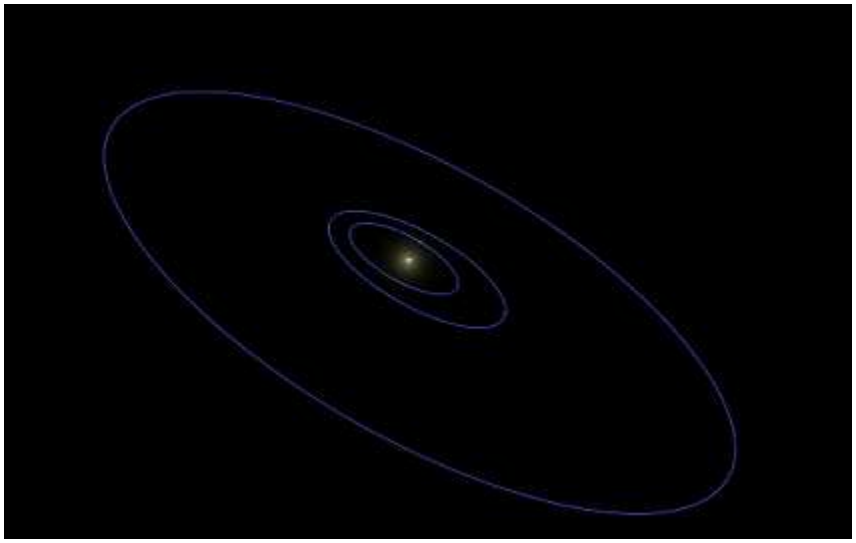
Mu Arae system for Orbiter



Contents:

1. **Mu Arae**

Mu Arae is a G3IV–V star 50.6 light years from the Sun. It is visible to the naked eye at an apparent magnitude of +5.12. It is both more massive and more luminous than Sol, and is thought to be older at 6.34 billion years. It is also has around twice the metallicity, or concentration of elements heavier than helium, of Sol.

2. **The planets; naming conventions**

There is some confusion over the designations given to the planets orbiting Mu Arae. From Wikipedia:

“The established convention for extrasolar planets is that the planets receive lower-case Roman letters starting from "b", in order of discovery. This system is used by the team led by Goździewski,[6] On the other hand, the team led by Pepe have proposed a modification of the designation system, where the planets are designated in order of characterization.[7] Since the parameters of the outermost planet were poorly constrained before the introduction of the 4-planet model of the system, this results in a different order of designations for the planets in the Mu Arae system. Both systems agree on the designation of the 640-day planet as "b". The old system designates the 9-day planet as "d", the 310-day planet as "e" and the outer planet as "c". Since the International Astronomical Union has not defined an official system for designations of extrasolar planets,[12] the issue of which convention is "correct" remains open, however subsequent scientific publications about this system appear to have adopted the Pepe et al. system, as has the system's entry in the Extrasolar Planets Encyclopaedia.[13][14]”

3. **Mu Arae c**

Mu Arae c is the first planet from Mu Arae. It has a semi-major axis of 0.09094 AU and a minimum mass of 10.55 Earths, similar to that of Neptune or Uranus.

Due to its proximity to the parent star, Mu Arae c likely has a higher amount of denser elements (such as silicates and ices) than Neptune. It may, however, be an eroded gas giant planet with a radius nearly 0.6 that of Jupiter. It is also likely tidelocked and moonless due to the influence of Mu Arae.

Here it is depicted at minimum mass and somewhat denser than Neptune, with featureless Sudarsky class IV-like sodium haze.

4. **Mu Arae d**

Mu Arae d is the second planet from Mu Arae, and has a minimum mass of 0.5219 Jupiters. At this distance it receives comparable UV radiation what Earth does from the sun, but any moons are likely too hot for liquid water to exist on their surfaces. Likewise, Mu Arae d itself is likely too hot to be mostly covered in water or ammonia clouds.

Here it is depicted as a class III jovian with three barren, lunar-like moons.

5. **Mu Arae b**

Mu Arae b is potentially the most interesting planet orbiting Mu Arae, due to its position within the habitable zone. It has a minimum mass of 1.676 that of Jupiter, and a semi major axis of 1.497 AU with an eccentricity of 0.128. Any

habitable moons orbiting the planet would likely experience harsh seasonal differences between apastron and periastron.

It is portrayed here as a class II Jovian (predominantly water clouds) with faint rings and four moons, the third of which is habitable.

6. **Mu Arae e**

Mu Arae e is the last known planet in the system. It has a higher minimum mass to planet b, at 1.814 Jupiter masses. It has a semi-major axis of 5.235 AU. There is a potential for Europa-like moons around this planet, that could harbour life in planetary subsurface oceans.

It is depicted here as a class I gas giant with a slightly hazy upper atmosphere and a large axial tilt, and also six moons.

7. **Fictional moons**

I have made several fictional moons for this addon. If you do not wish to have these moons in the system, there is an alternate configuration file without moons that can be used. It should install to the same folder as this .pdf file; it must be renamed to MuArae.cfg and placed in the “Config” folder to have an effect. Please note however that this will break the scenarios provided.

Mu Arae b III is habitable to UMMUs, and has two bases on the surface.

8. **Developer’s notes**

I have taken the utmost care to make all bodies within the system as plausible as possible with regard to modern planetary science and astrophysics.

The bases were admittedly a slap-together, I would have much preferred to go into them in-depth. They need surftiles- a bit difficult to find for a fictitious moon some 50 light years away…

The atmospheres need fixing- the temperatures, pressures and compositions are not fully correct.

As for bugs, at the time of writing the doc I have found two:

-Sky flickers black on both Mu Arae b III and Mu Arae b IV when full time acceleration is engaged

- DG steering is jerky on the surface of Mu Arae b III.

I don’t know the cause of either (if I did these bugs would have been squashed some time ago), so if you think you do please contact me.

The textures aren’t what they could be, I admit. I am no graphics artist.

If you have any bug reports or suggestions, or you are willing to help in the form of texturing or data, please contact me on Orbiter-Forum. If I do not know the bugs, I will not be able to fix them.

9. **Disclaimer and redistribution**

I am not responsible if this addon negatively affects anything (your computer exploding, your cat getting stuck in a tree, your business going bankrupt etc etc).

You may NOT, under ANY circumstances, redistribute or modify these files without my prior permission.

Happy orbiting!

10. **References**

http://en.wikipedia.org/wiki/Mu_Arae#Planet_designations