

# The impact of metallicity on stellar magnetic activity and planetary atmosphere loss

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**MADRID-AREA EXOPLANET SCIENCE MEETING**

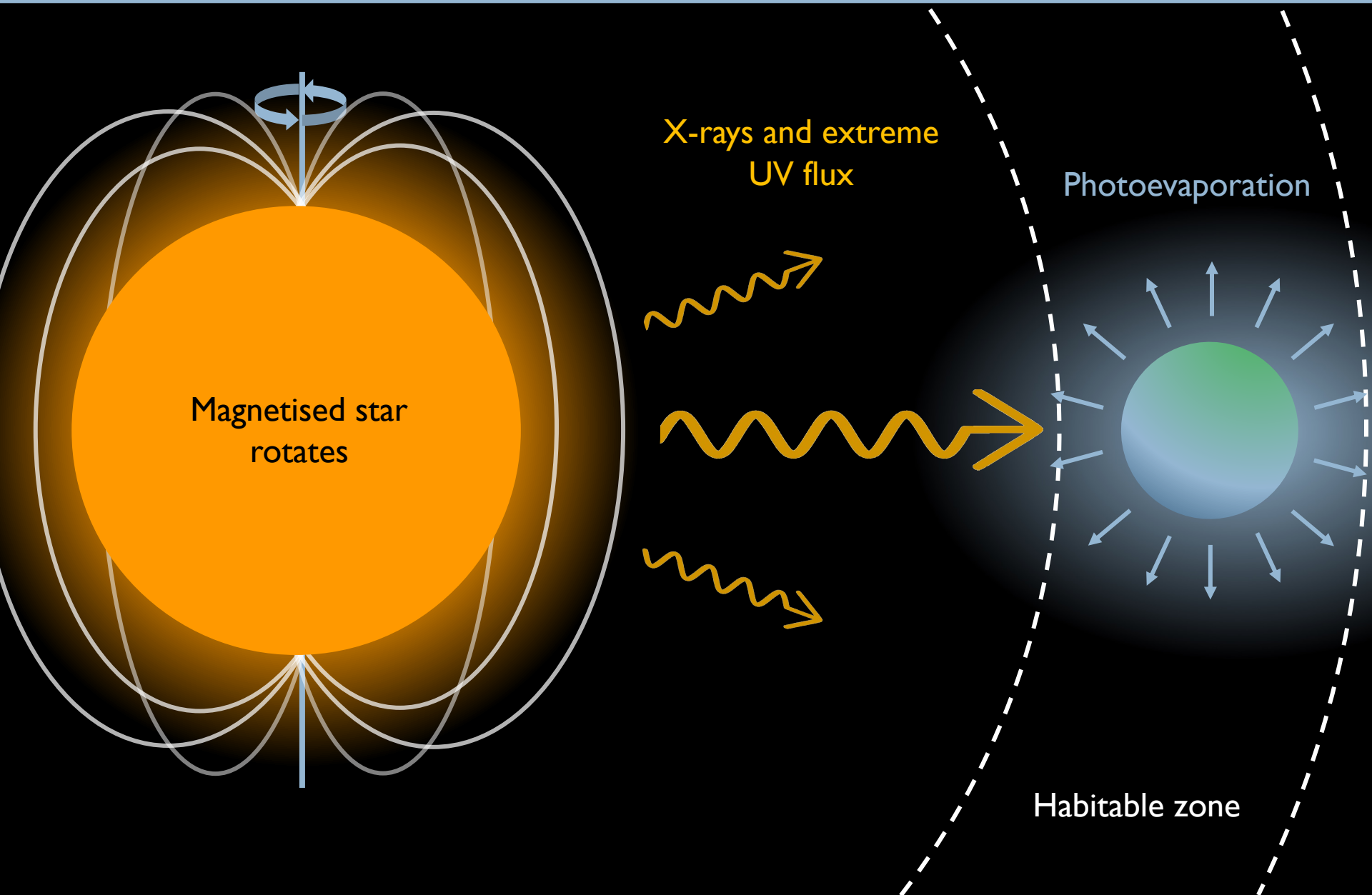
Charlotte Fairman, Victor See, Oliver Hall



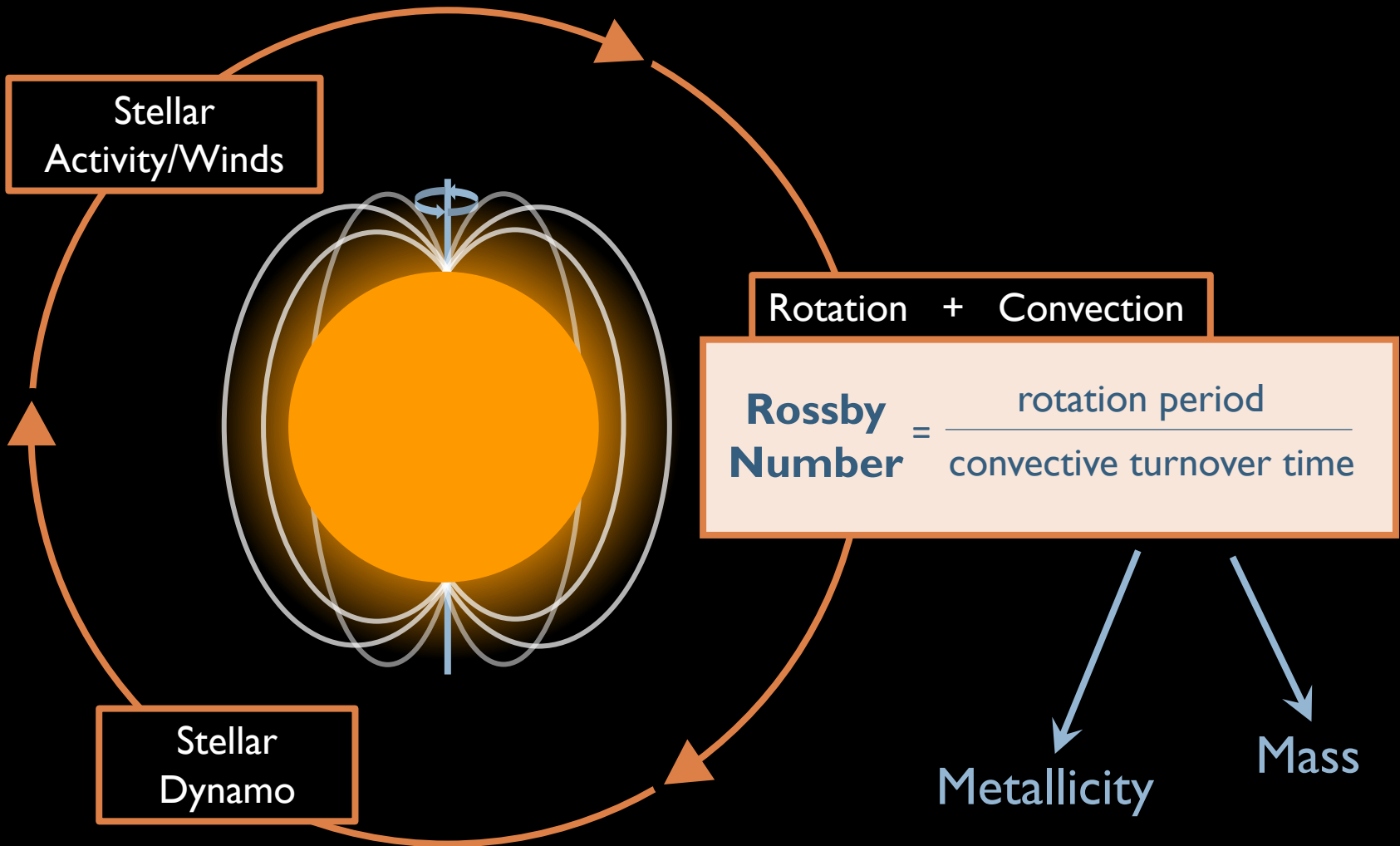
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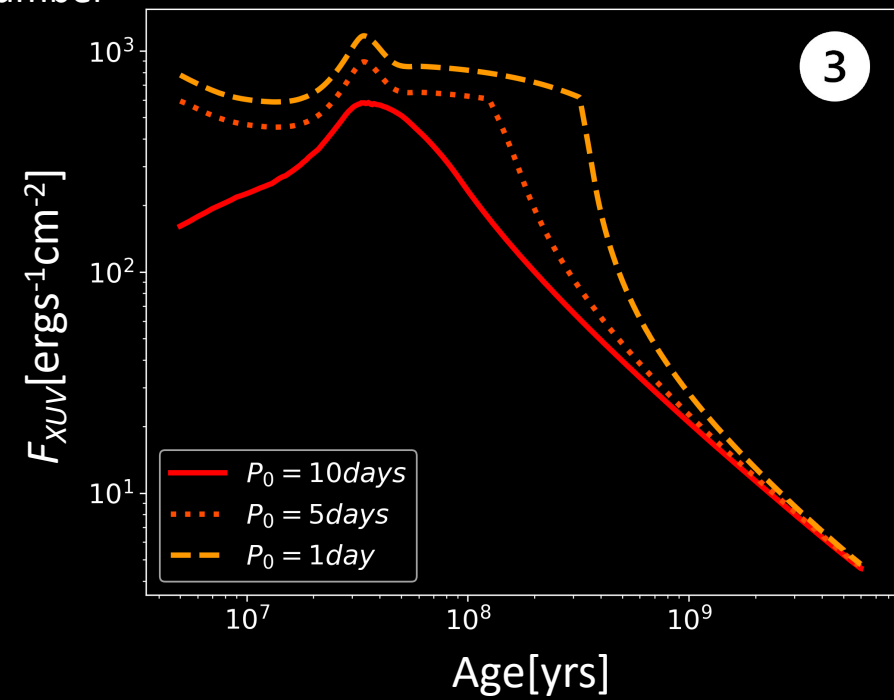
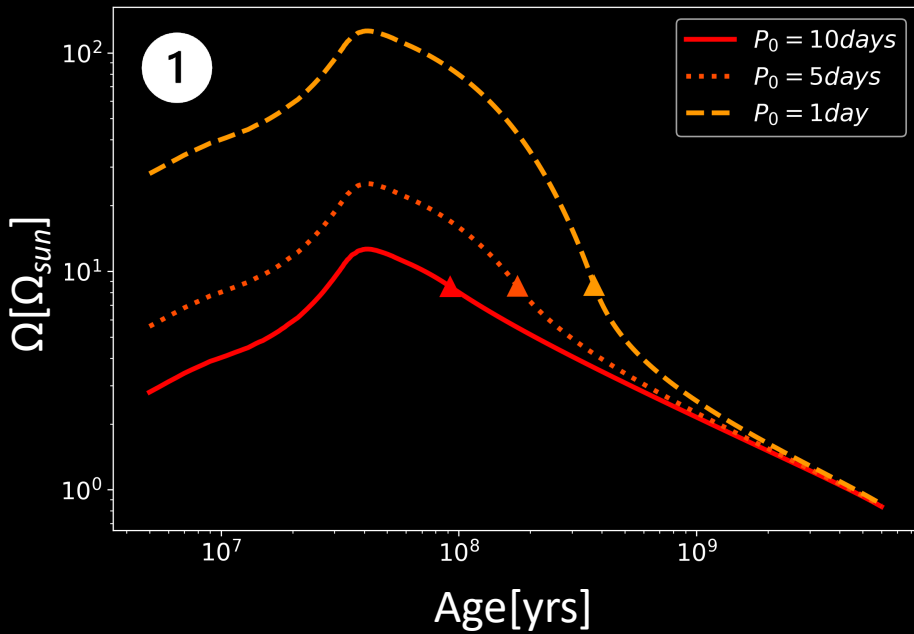
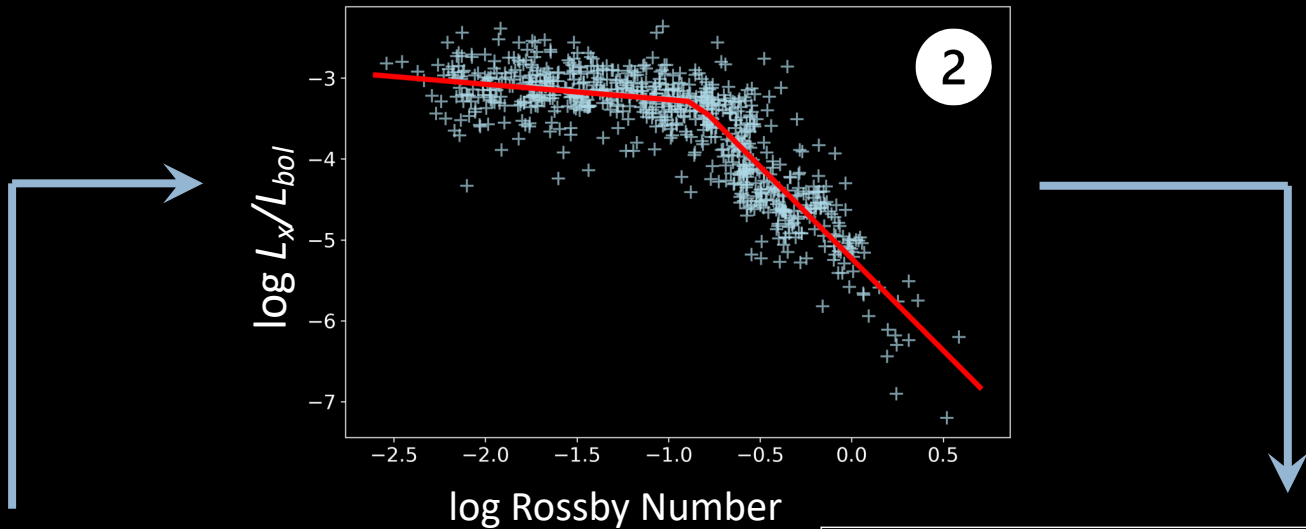
# Overview



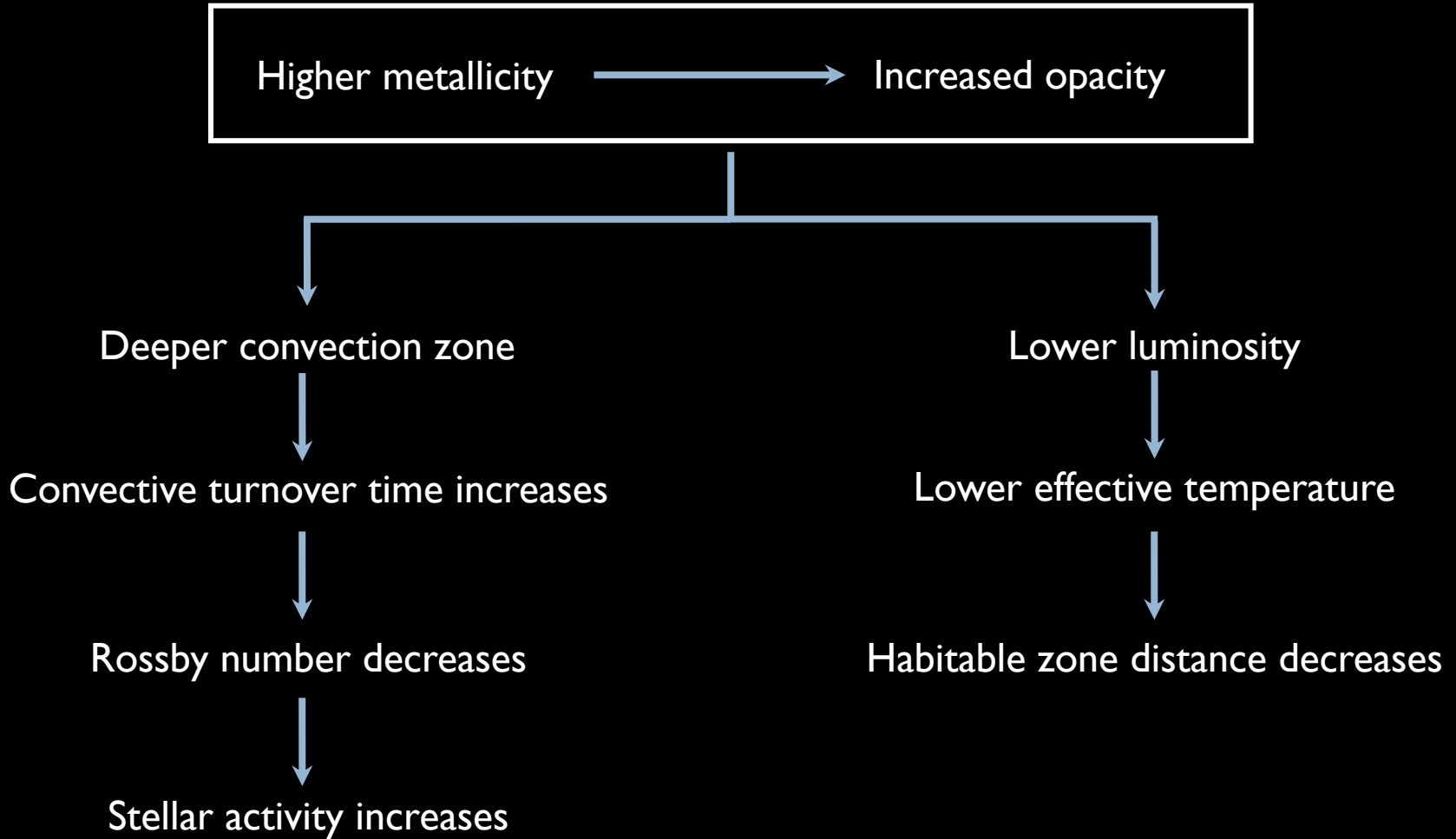
# Rotation and Activity



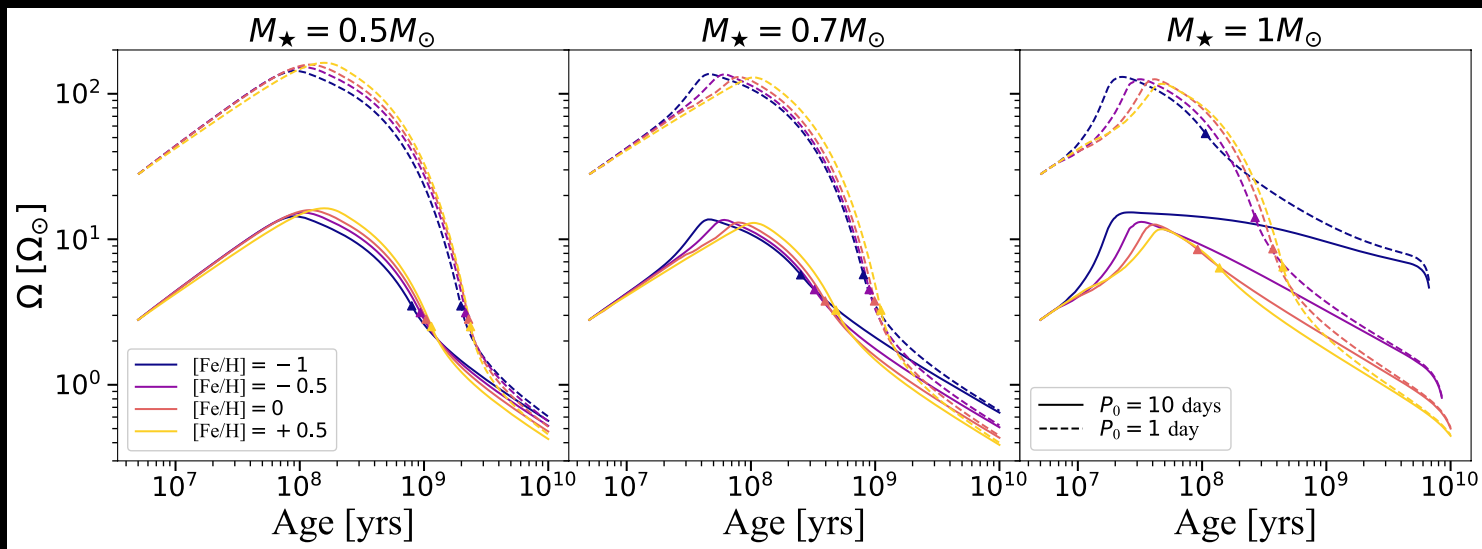
# Rotational Evolution to XUV luminosity



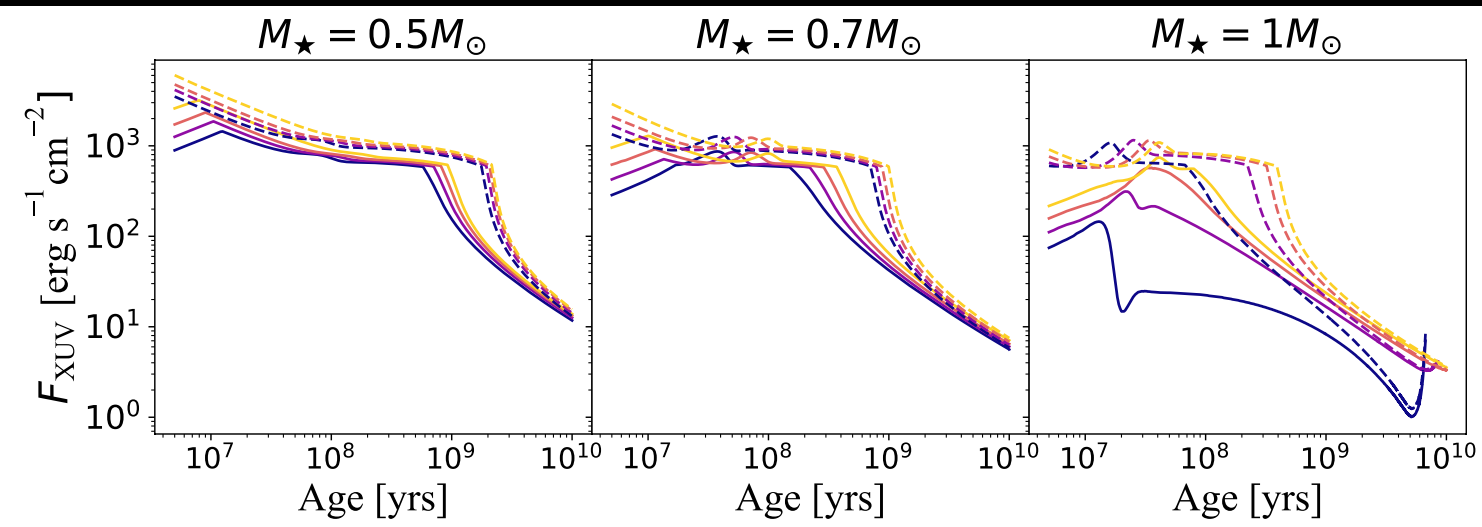
# Metallicity



# Metallicity



Rotational  
Evolution  
(angular  
momentum)

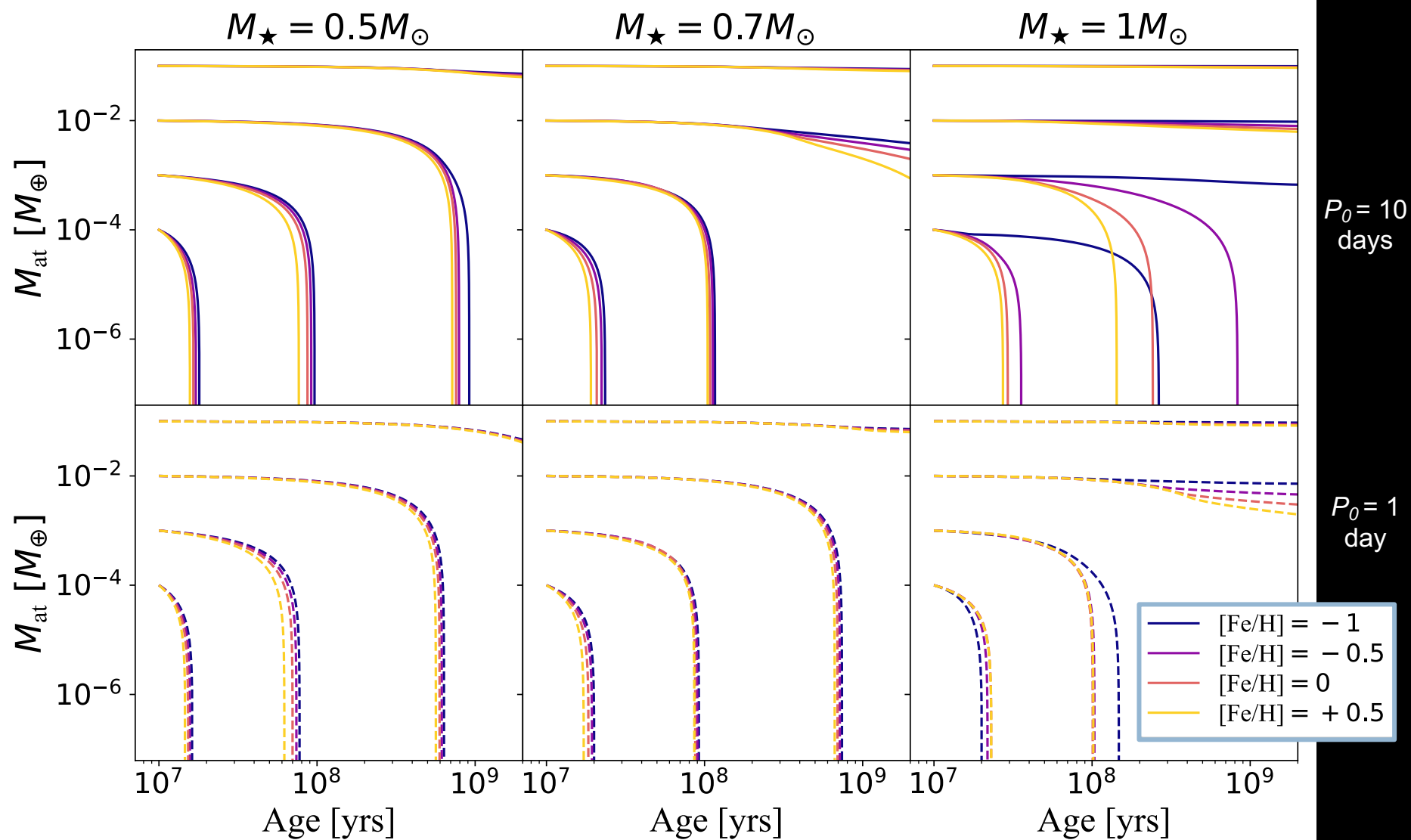


XUV flux  
evolution

See et al. (in prep)



# Atmospheric Mass Loss



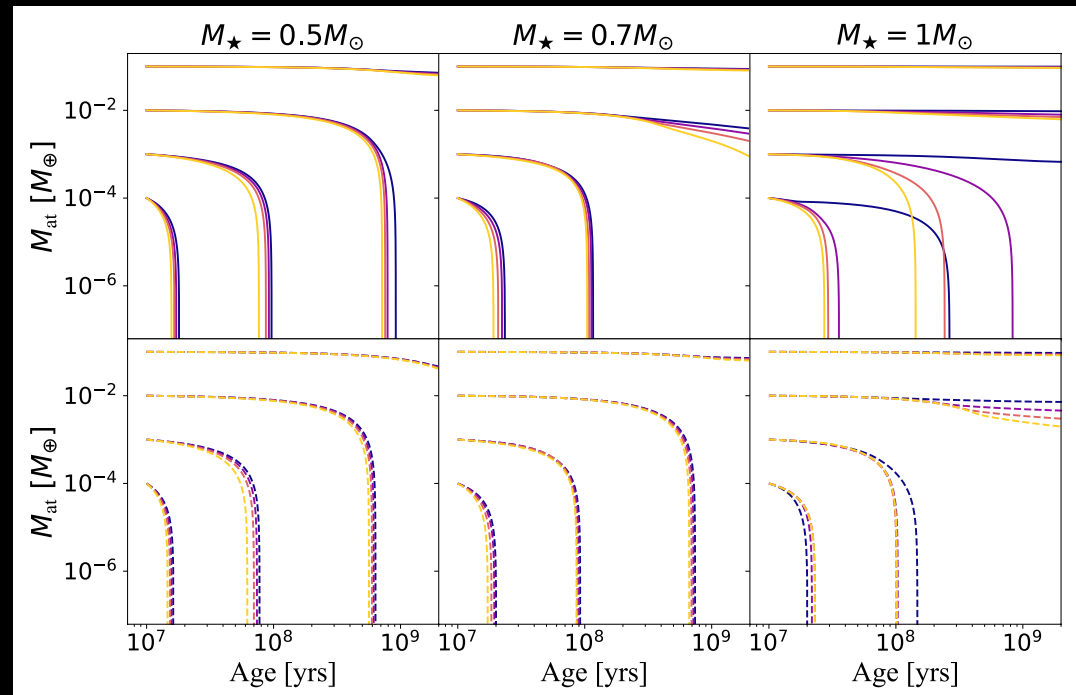
# Summary

At a given age, atmospheres of planets in the habitable zone around metal rich stars lose mass faster than metal poor stars.

Metallicity is important for:

- Stars with masses close to solar mass
- Stars that were initial slow rotators

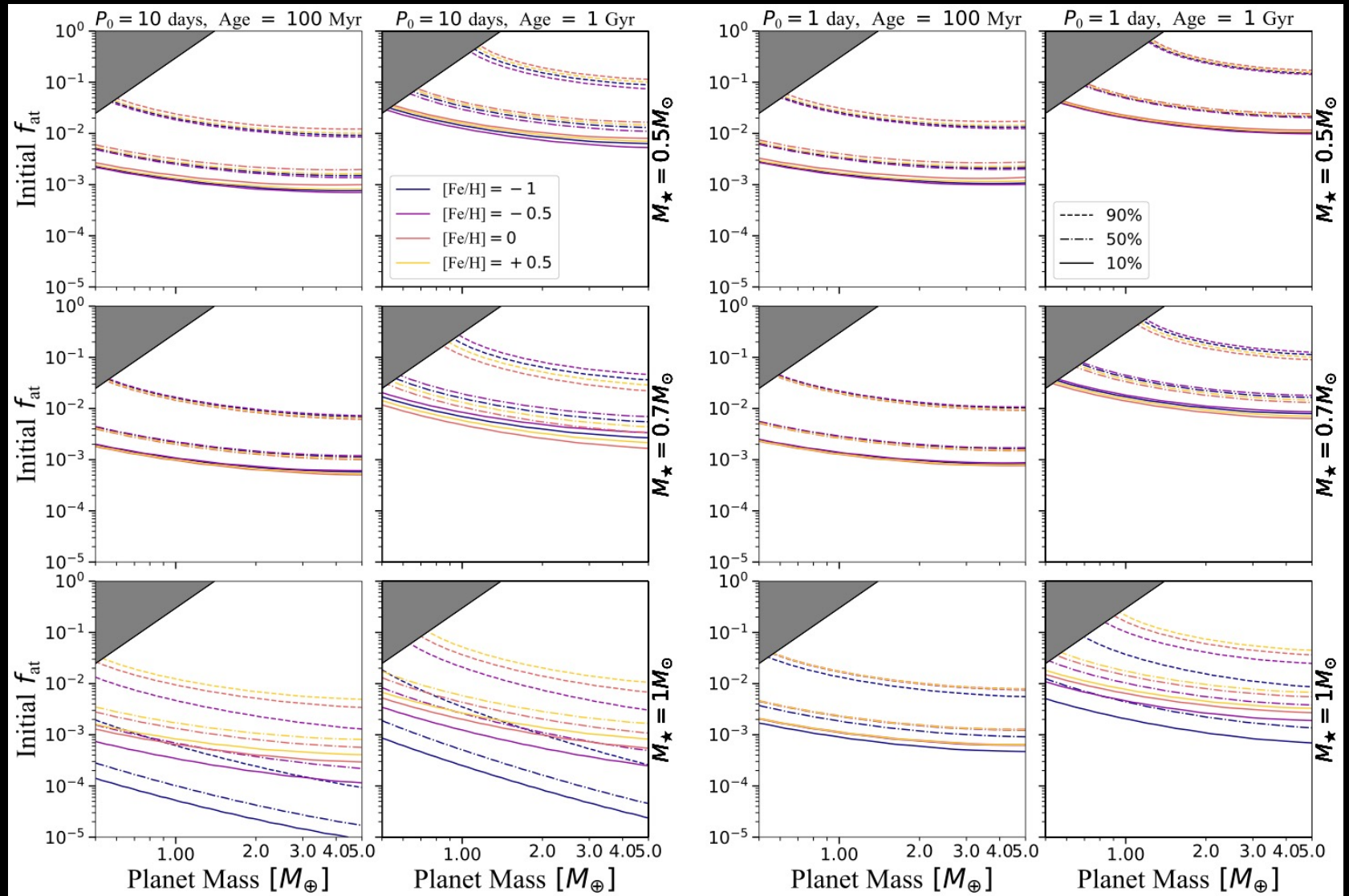
The initial atmospheric mass of the planet determines whether stellar metallicity will be important in its evolution.





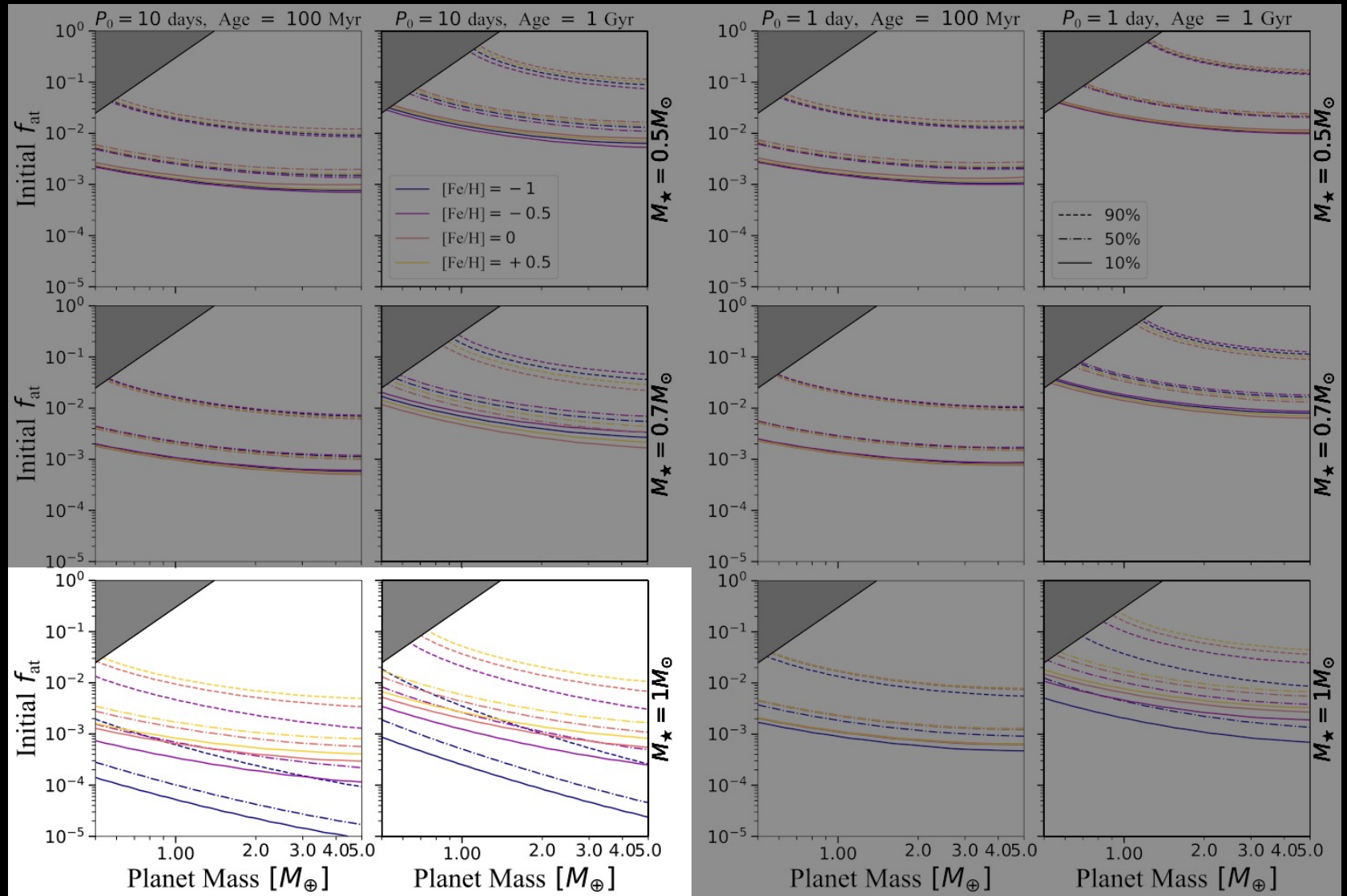


# Atmosphere Mass Remaining at 100 Myr and 1 Gyr



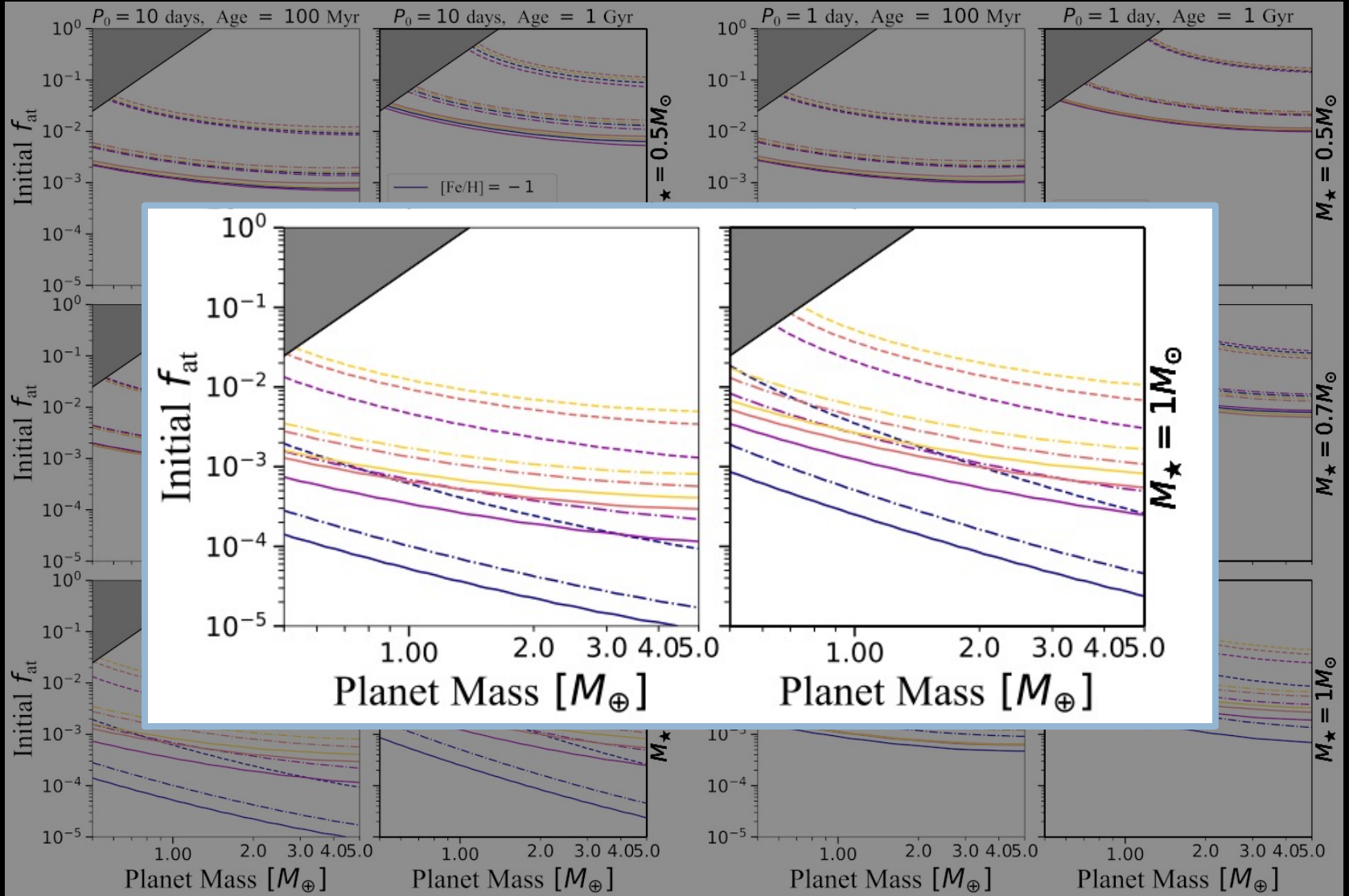
See et al. (in prep)

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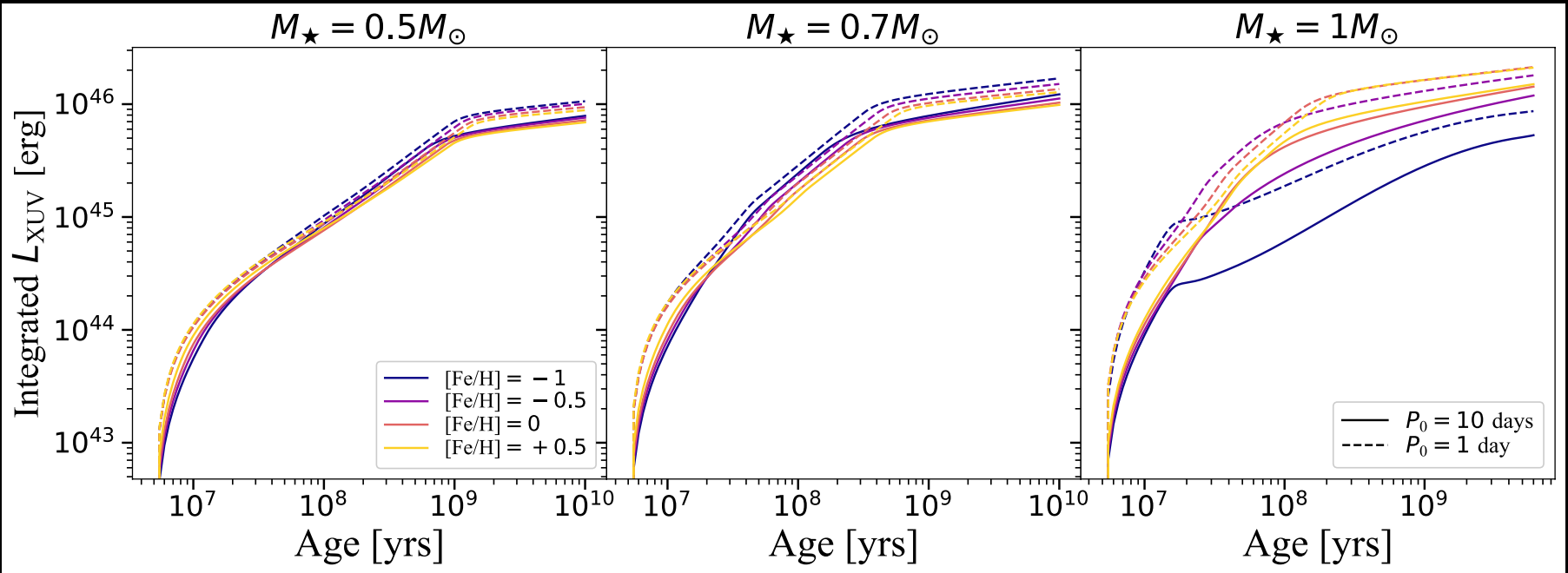
See et al. (in prep)

# Atmosphere Mass Remaining at 100 Myr and 1 Gyr



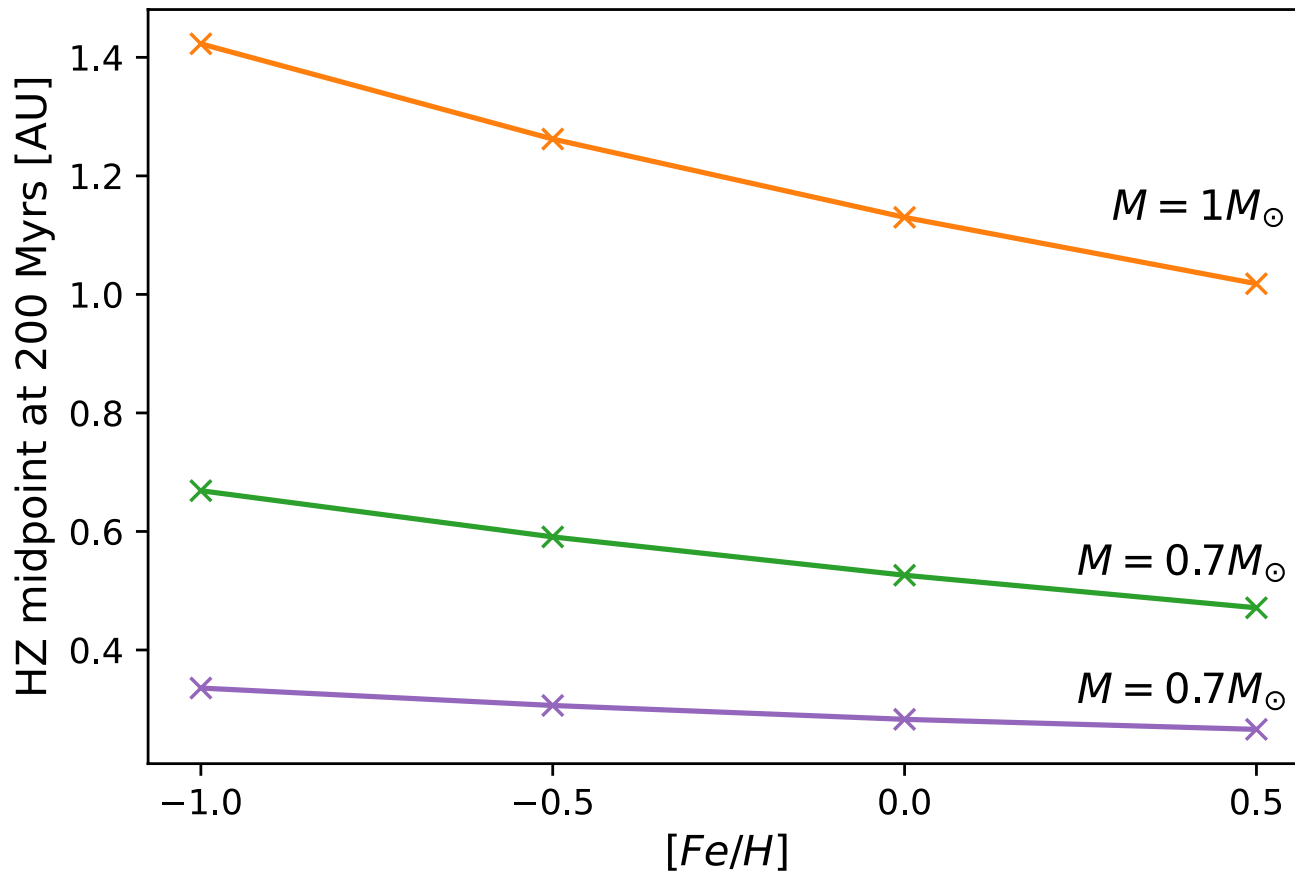
See et al. (in prep)

# Integrated XUV Luminosity





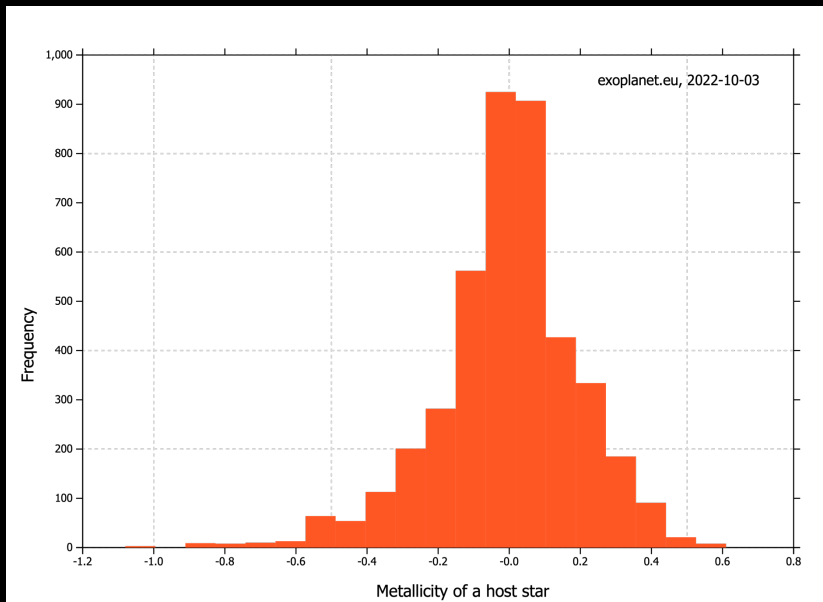
# Habitable Zone Midpoint





# Population of host stars

## All confirmed exoplanets



## Planet Mass < 5 Earth Masses

