

Topics, grouped into related areas:

1) Jupiter's and Saturn's Moons

Life in the subterranean ocean on Europa

How do Jupiter's 4 inner moons affect its net energy intake

Can we send rovers or spacecraft to Saturn's and Jupiter's moons?

(note NASA's planned mission to Europa by 2025)

2) Asteroids, Comets, and Collisions

Asteroid collisions with the Moon, Earth, Jupiter

Difference between collisions of conglomerate and differentiated asteroids

Asteroid farming/mining

(Related topic) How to exploit resources on other solar system objects (moons, planets, ...)

Gas Giant Planets' reaction to comets and other impacts

How would Earthlings protect against an asteroid attack

3) Earth and its Moon

Back side of the moon – why is it so different from front side?

Why doesn't Earth have more moons

4) Life on other worlds (astrobiology)

Life forms based on Si instead of carbon

Effect of spacecraft transporting bacteria

Did life on earth come here from elsewhere in the Solar System? (called Panspermia)

How can we make Mars habitable?

Colonies on Mars

Life in the subterranean ocean on Europa

5) Climate Change

What are the main components of climate change on earth?

What happens to solar radiation in the different layers of the Earth's atmosphere

If Mars had liquid water, what happened to it?

If Mars were in Earth's orbit, how would it be different? and ...

If Mars had a good atmosphere in its current orbit, how would it be different?

Long term consequences of global warming on earth

## 6) Solar System Formation

Solar system formation – how close together can planets get (without making solar system unstable)  
What is the importance of the Frost Line – also what is the evidence for it?

## 7) Other Solar System Topics

How long will scientific evidence of humans take to disappear completely?  
Stellar parallax – and what will parallax measurements with the Gaia spacecraft discover?  
How are the Northern Lights formed, and are they different on other planets?  
How do tidal forces affect Jupiter?  
Elevator to get into space, reach the moon  
Studying ice on Mercury  
How to exploit resources on other solar system objects (moons, planets, ...)

## 8) Excellent topics but not really appropriate for Astro 18

How are galactic bars formed  
Relativity  
Black hole formation  
Dark energy  
Big Bang  
Multiverses  
Wormholes  
Time travel  
How big can a black hole be to support a galaxy  
What different types of galaxies are there? How did they form?  
What is different in dark matter haloes between new and old galaxies  
How can we detect dark matter  
Black body radiation