

# Exploring the Solar System VI – Origins



## Exploring the Solar System VI

## Origins

How Did Our Solar System Form?

What Clues Do We Have?

What Do Simulations Tell Us?

What Questions Remain?



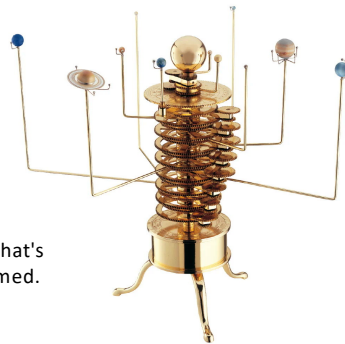
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## How To Build a Solar System

When you build a model of the solar system (an orrery) it is built from the inside out.

Start with the Sun, then add Mercury, then add Venus, then add Earth, ...

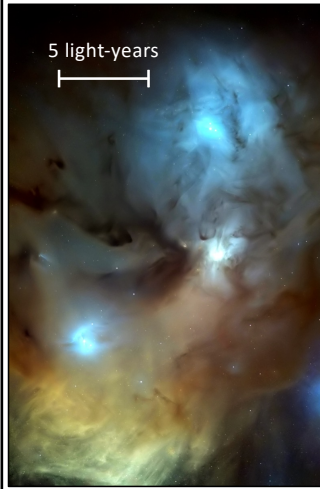
That's fine for an orrery, but that's not how the solar system formed.



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## Rho Ophiuchi Cloud

5 light-years



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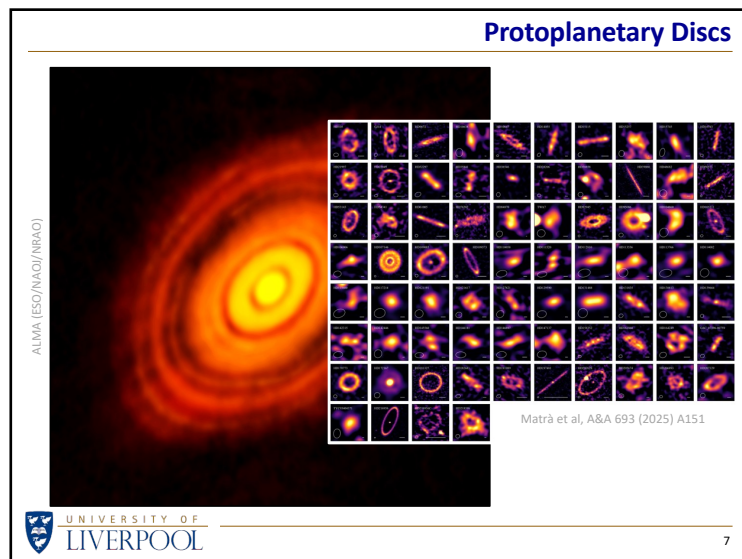
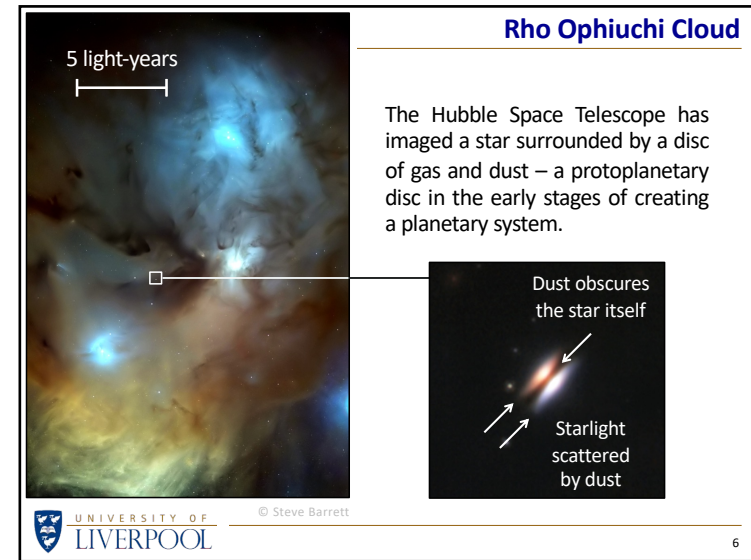
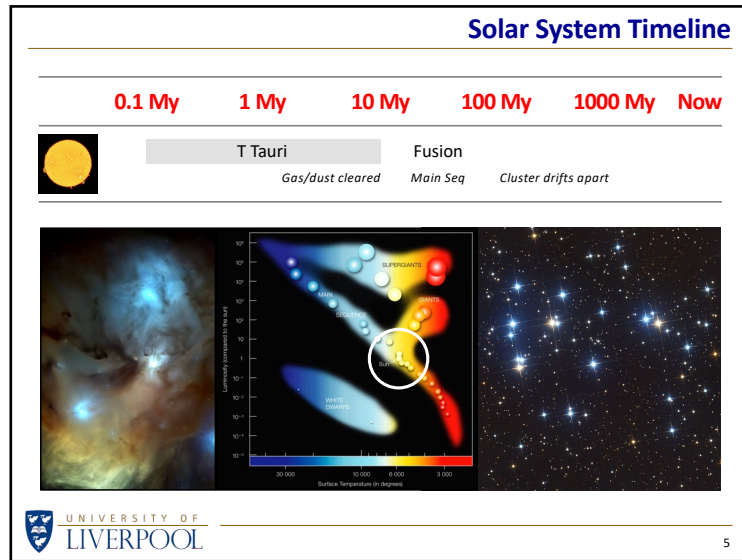
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At a distance of only 400ly the Rho Ophiuchi cloud is the nearest star-forming region to our solar system.

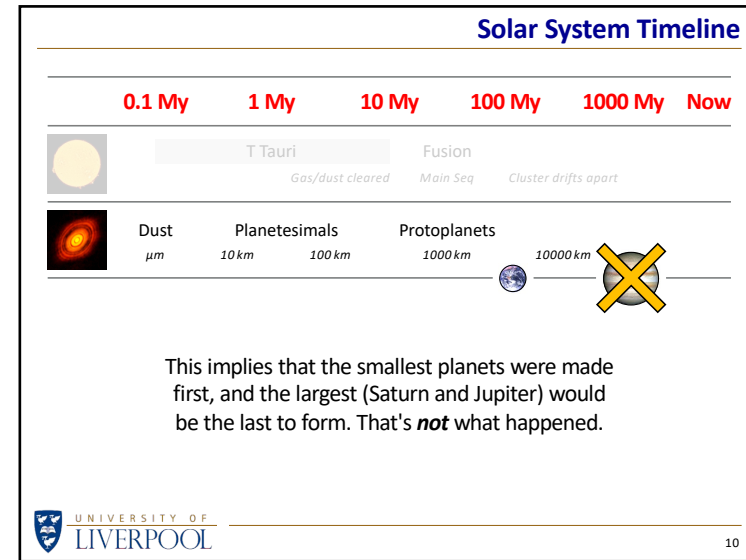
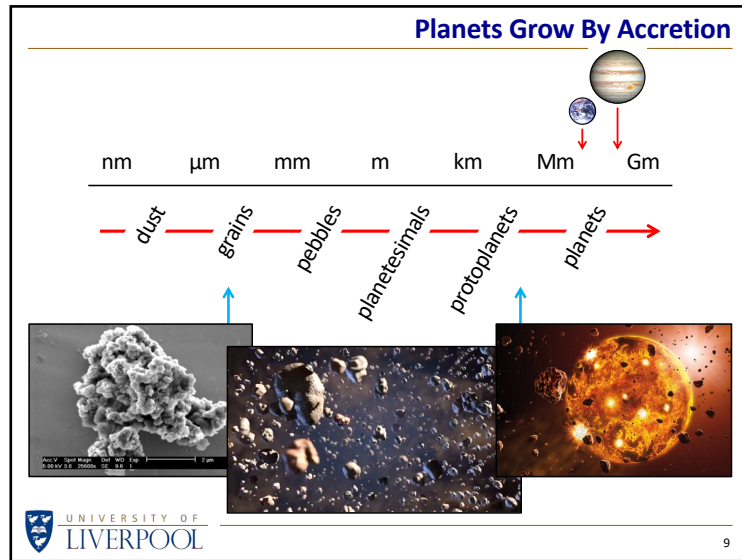
Hundreds of new stars are forming and the total mass of the cloud is enough to make thousands of solar systems.

Our Sun and planets formed from a cloud similar to this one.

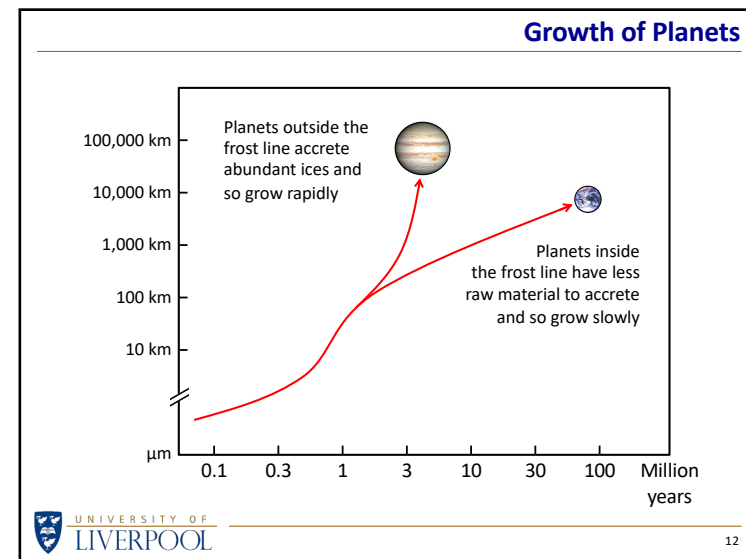
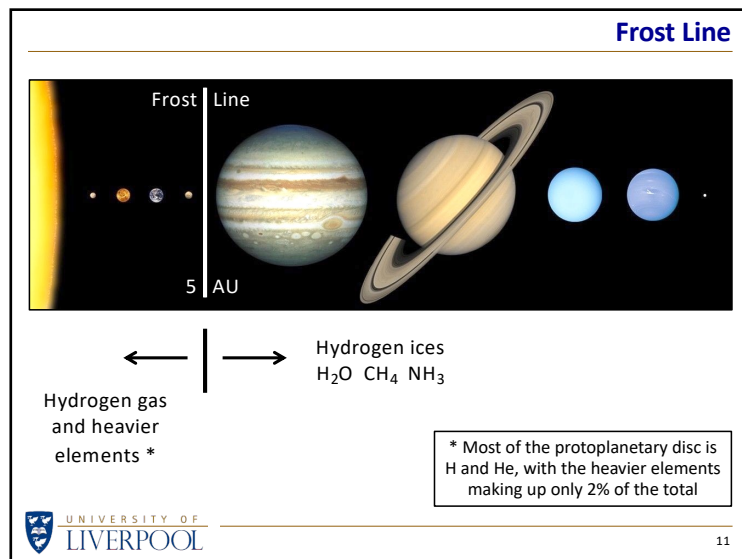
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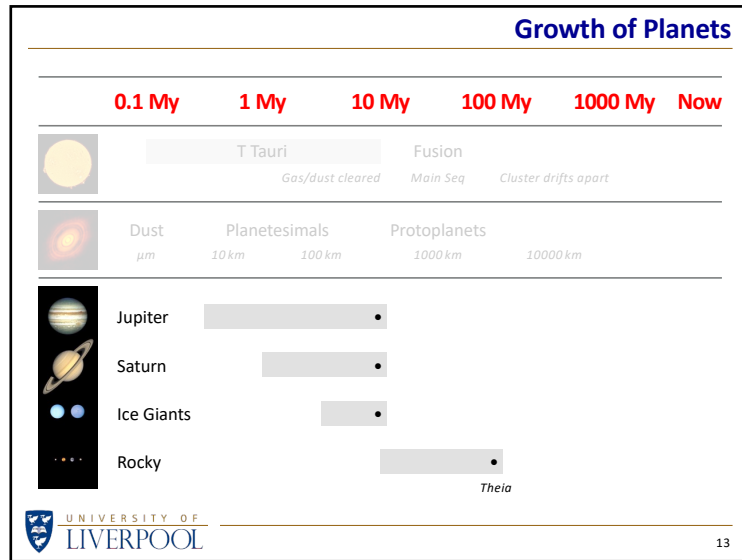
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This implies that the smallest planets were made first, and the largest (Saturn and Jupiter) would be the last to form. That's **not** what happened.



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## Questions To Be Answered

- Where did Earth's water come from?
- What caused the Late Heavy Bombardment?
- Why is Mars so small (compared to Earth)?
- How did the Kuiper Belt and Oort Cloud form?





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## Craters on the Moon



Impact craters on the Moon were formed at different times in its past. Not many were made after Mare Imbrium flooded with lava.

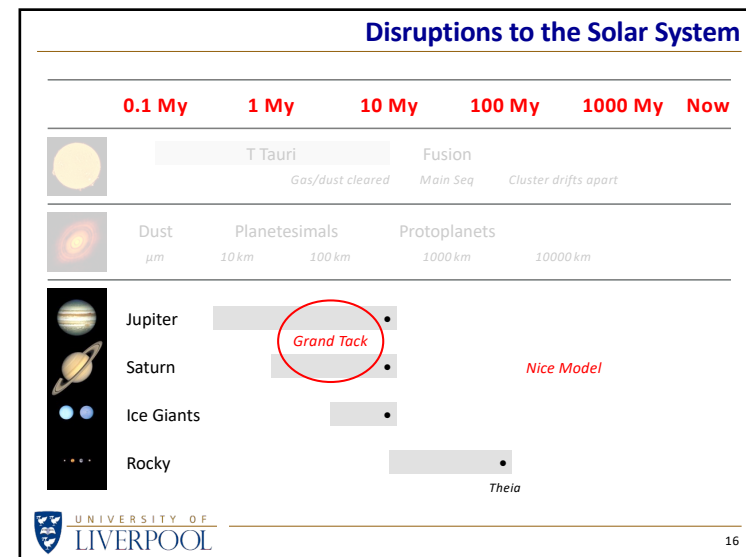
Rock samples from Apollo missions indicate that a heavy bombardment took place ~4 billion years ago.

Any hypothesis on the formation of our solar system should explain this 'Late Heavy Bombardment'.

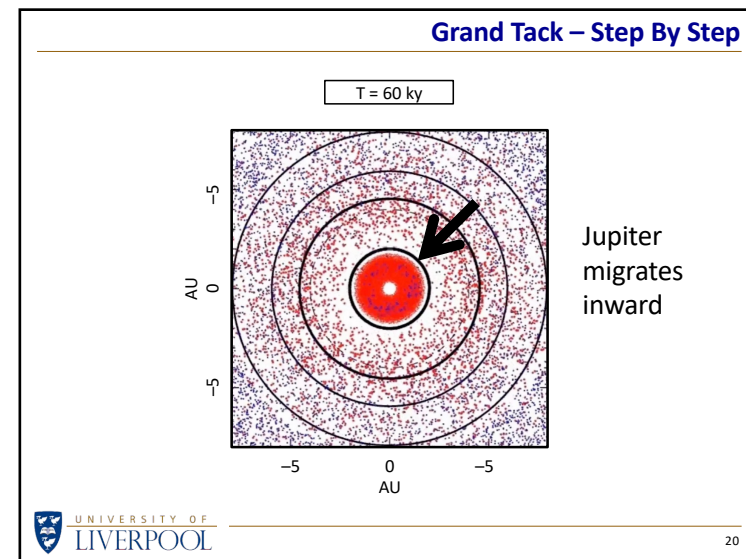
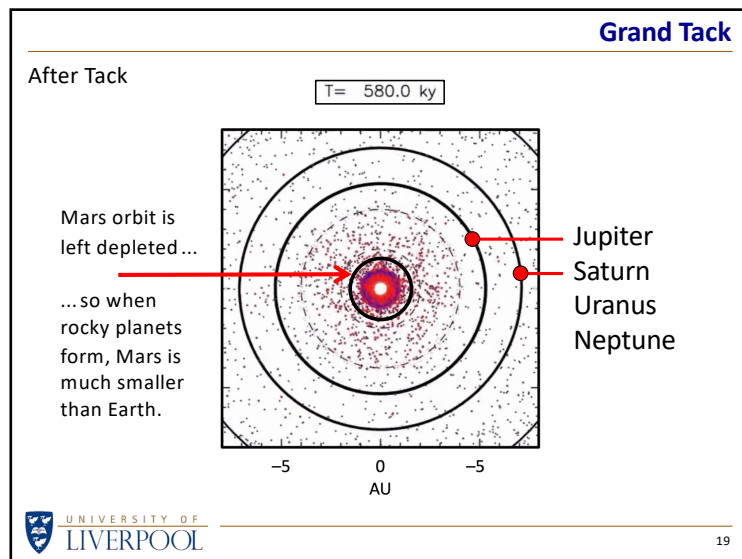
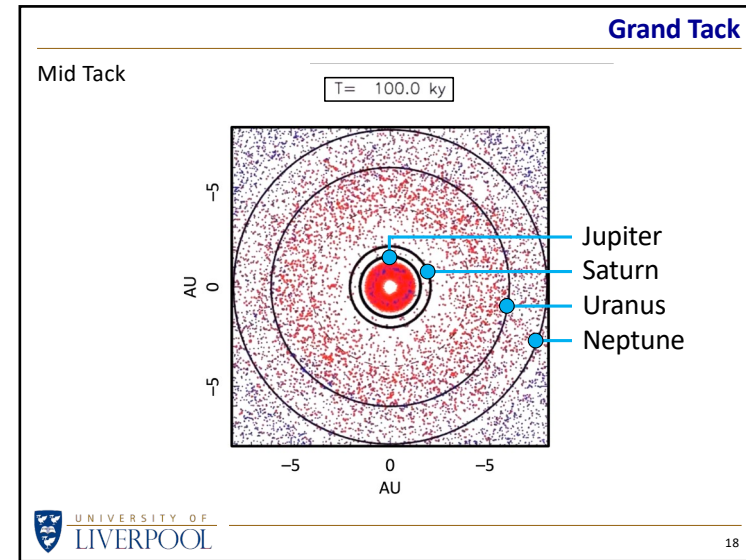
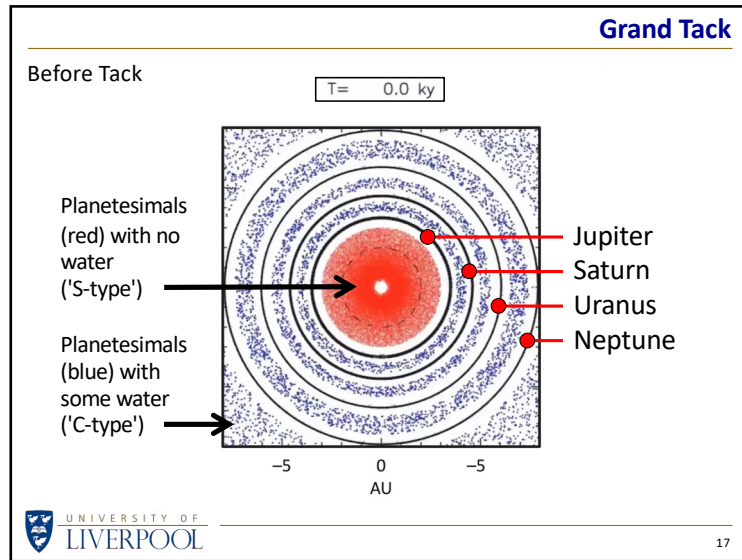
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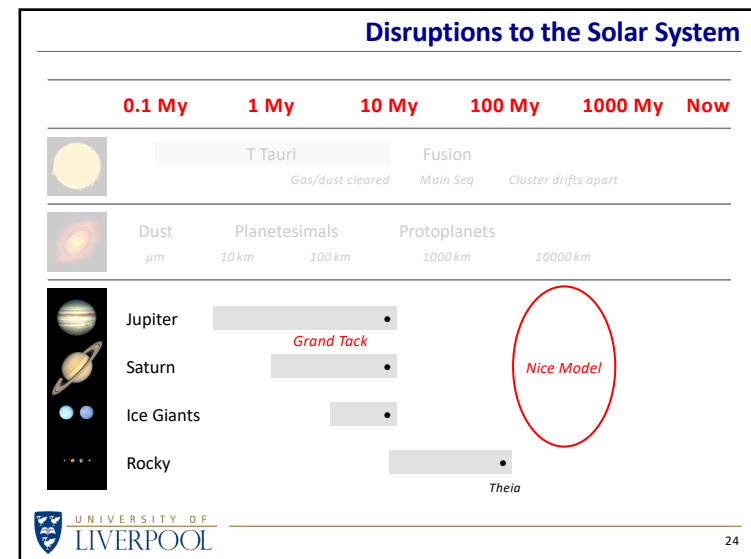
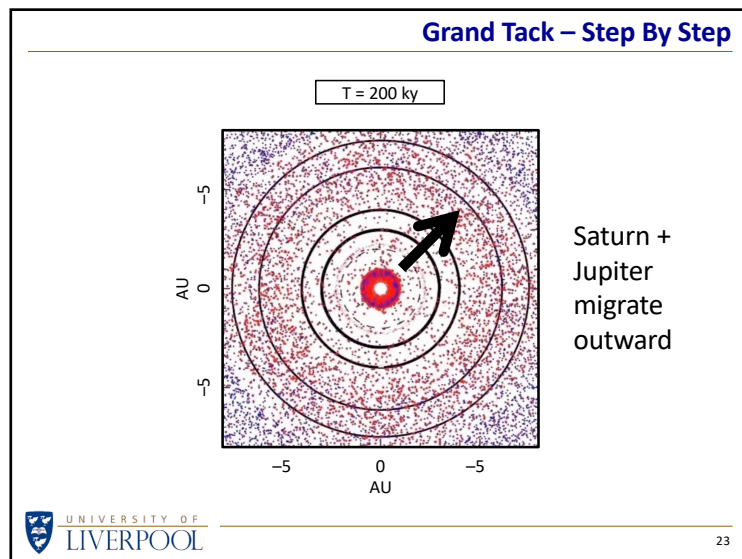
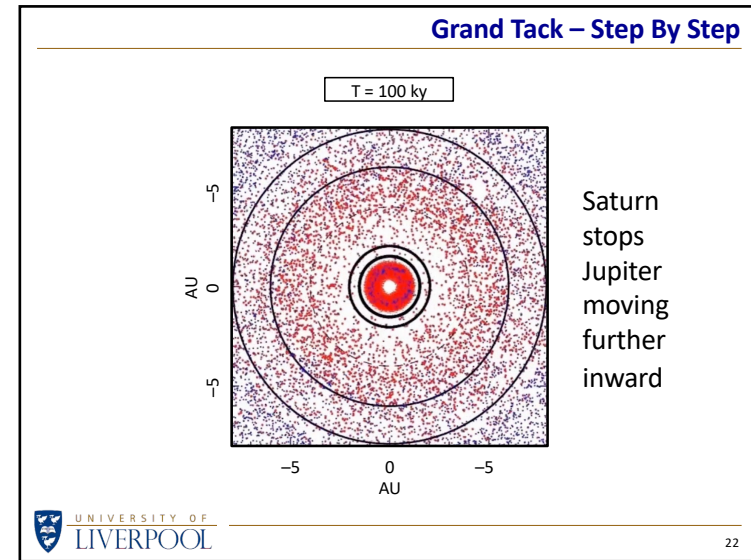
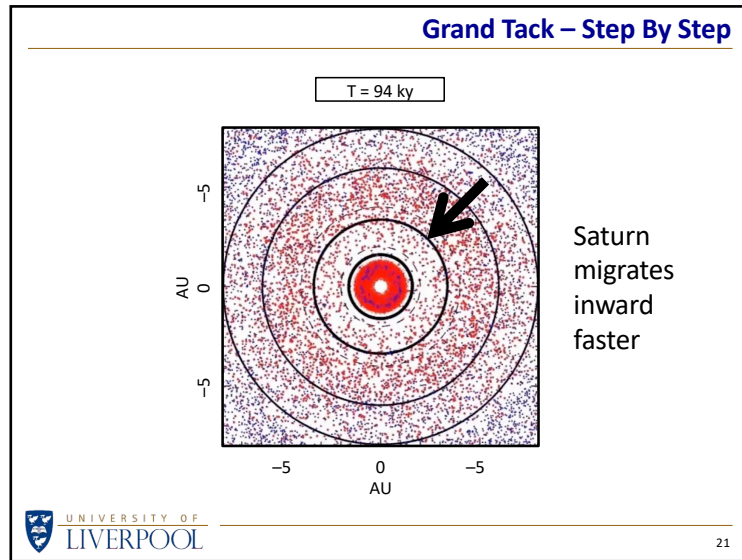
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