

Earth's mesosphere during possible encounters
with massive interstellar clouds 2 and 7 million
years ago

Paper by: Jesse Miller and Merav Opher
Presentation by: Kate Boyer

What is the heliosphere?

— — —

- A solar wind bubble that surrounds our solar system
- Forms after the solar wind hits an interstellar medium.
- Integral to understanding the evolution of our galaxy and the formation of magnetic and electric fields.

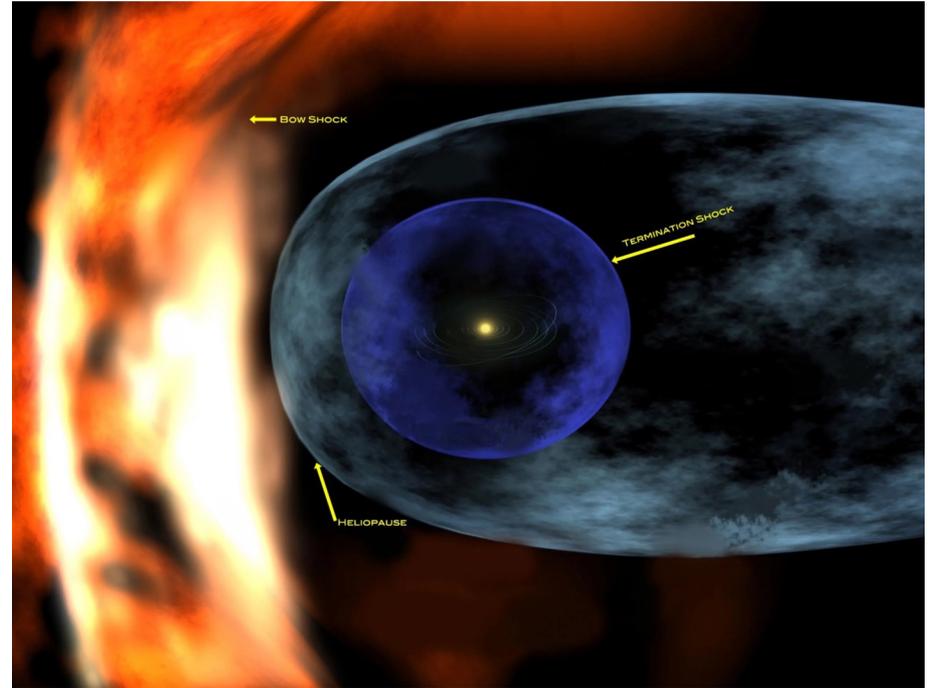


Image from: Nasa Science

What occurred?

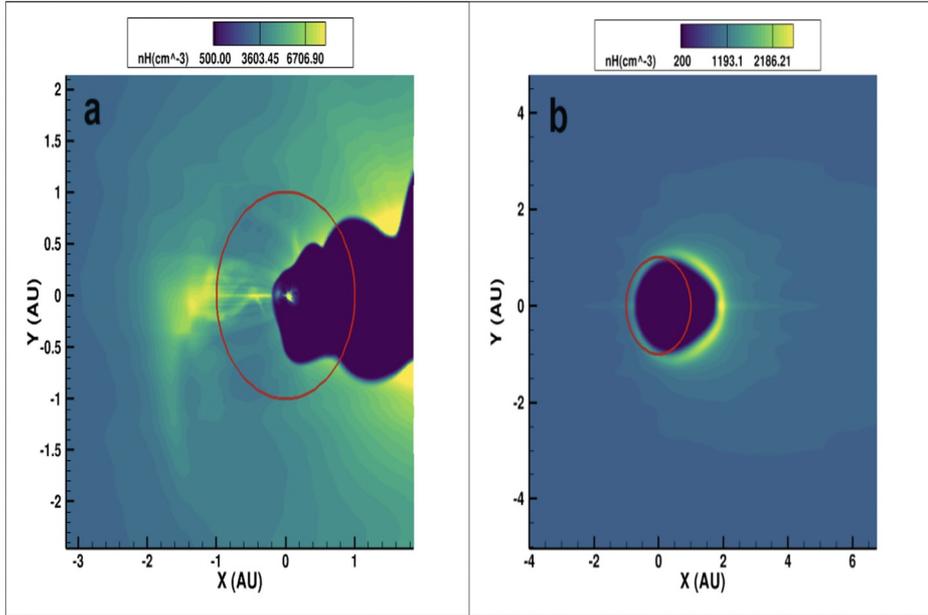


Image from: Miller and Opher

- 2 Myr and 7 Myr, the Heliosphere crashed into outside interstellar mediums
 - Little Lynx Cloud
 - The Local Bubble
- Heliosphere was squished and shrunk and Earth lost its shield
- As a result, a lot of hydrogen was put into our atmosphere and clouds were created

The Purpose of the Paper

- Previous research stated that an Ice Age could have been caused by NLCs
- Authors want to confirm or deny previous research done using modern tech

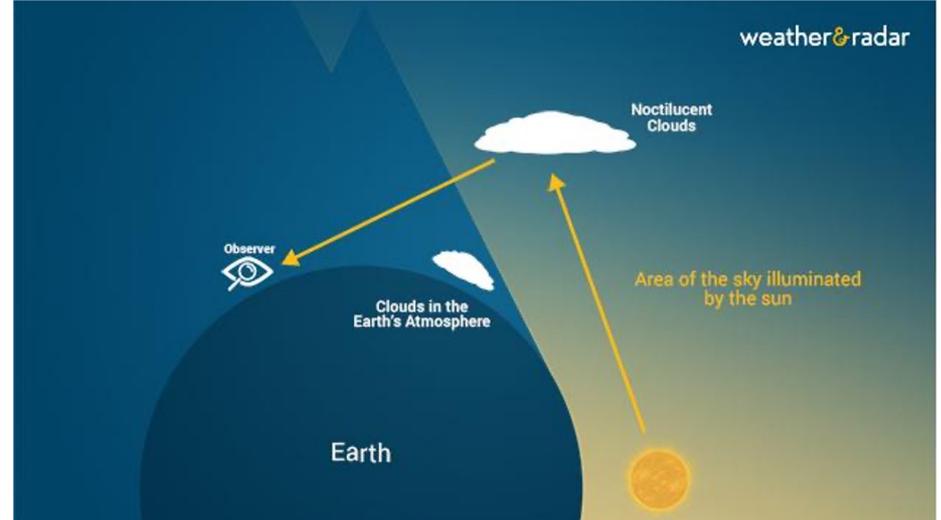


Image from Weather and Radar UK

Methodology

- Used NASA atmospheric model
- $\varphi = nv$
- Three simulations used
- Ran over 24 years

Results

- NLCs form for a total of 25 days usually but go up to 45 days with interstellar medium
- Previous research shows that NLCs should cover the world but the simulation shows it does not.

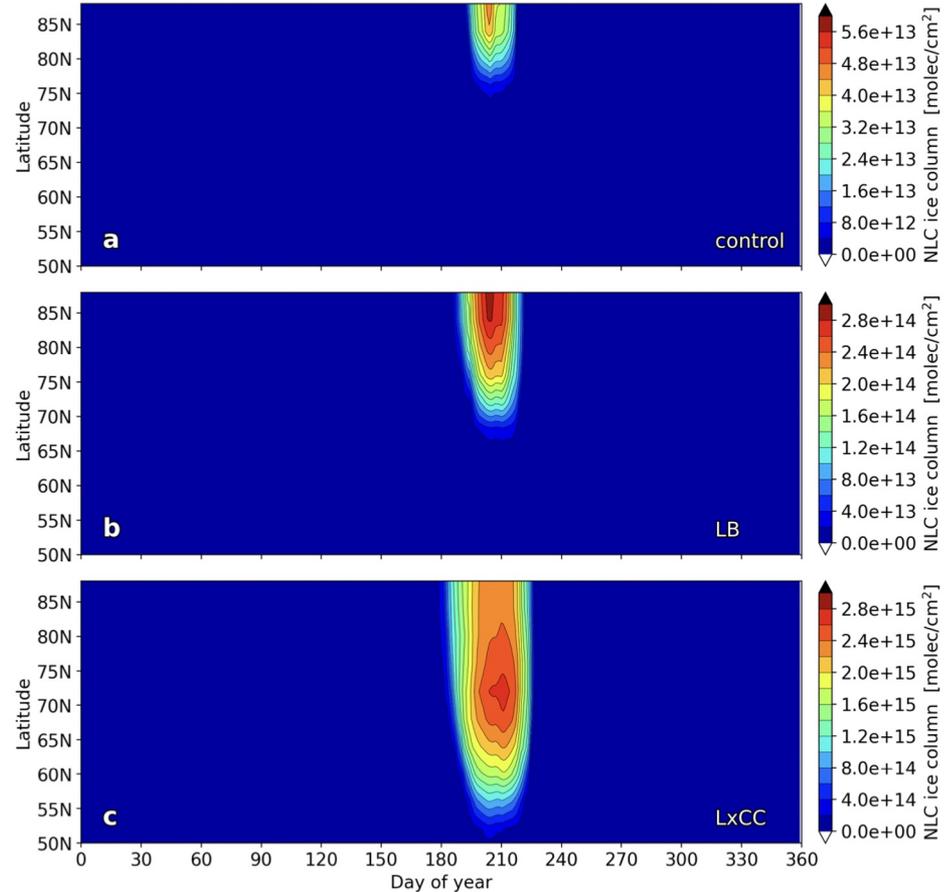
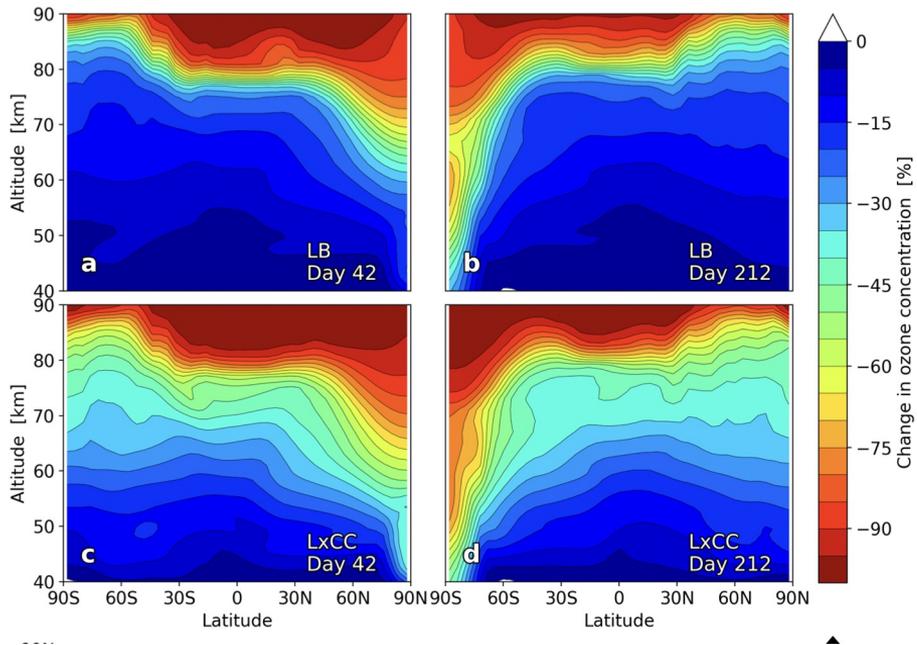


Image from: Miller and Opher

Results (con.)



- Water can change the ozone (though not by a lot)
- The Ozone in the mesosphere ended up decreasing by 50-80%!
- Not concerning

Image from: Miller and Opher

Conclusion

- Author set out to prove or disprove previous research
- Research disproved previous research
- In line with newer research
- More research must be done

Questions?