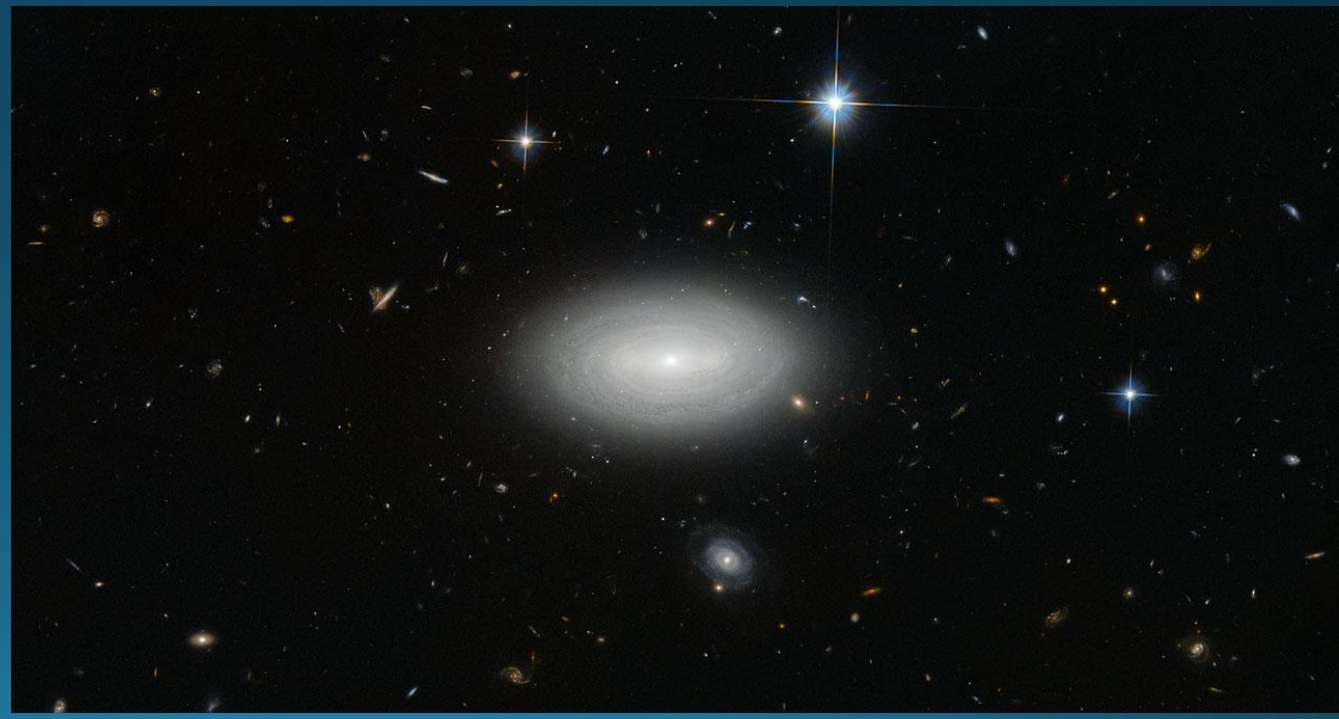
Properties of Void Galaxies

By Sean Bruton
Advised by Xinyu Dai
University of Oklahoma



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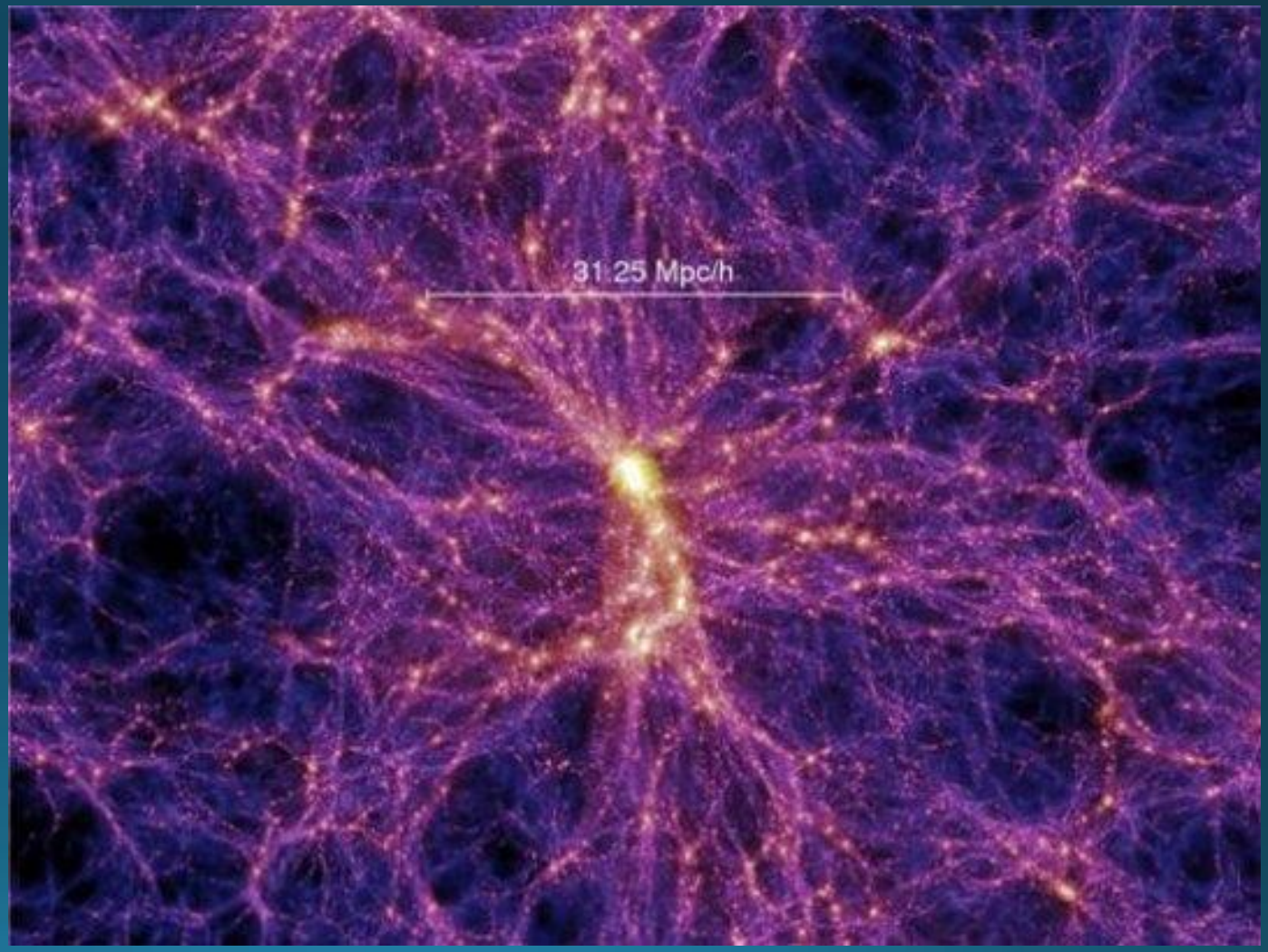
The Large Scale Structure of the Universe

- On the largest scale, galaxies collect into clusters which make up filaments and walls
- Between these filaments and walls are voids—regions which have extremely few galaxies
- Filaments, walls, and voids make up the cosmic web



[1]

Void Galaxies

- Galaxies which occupy voids
- Have few neighboring galaxies
- Allows them to evolve with little gravitational interaction with neighbors

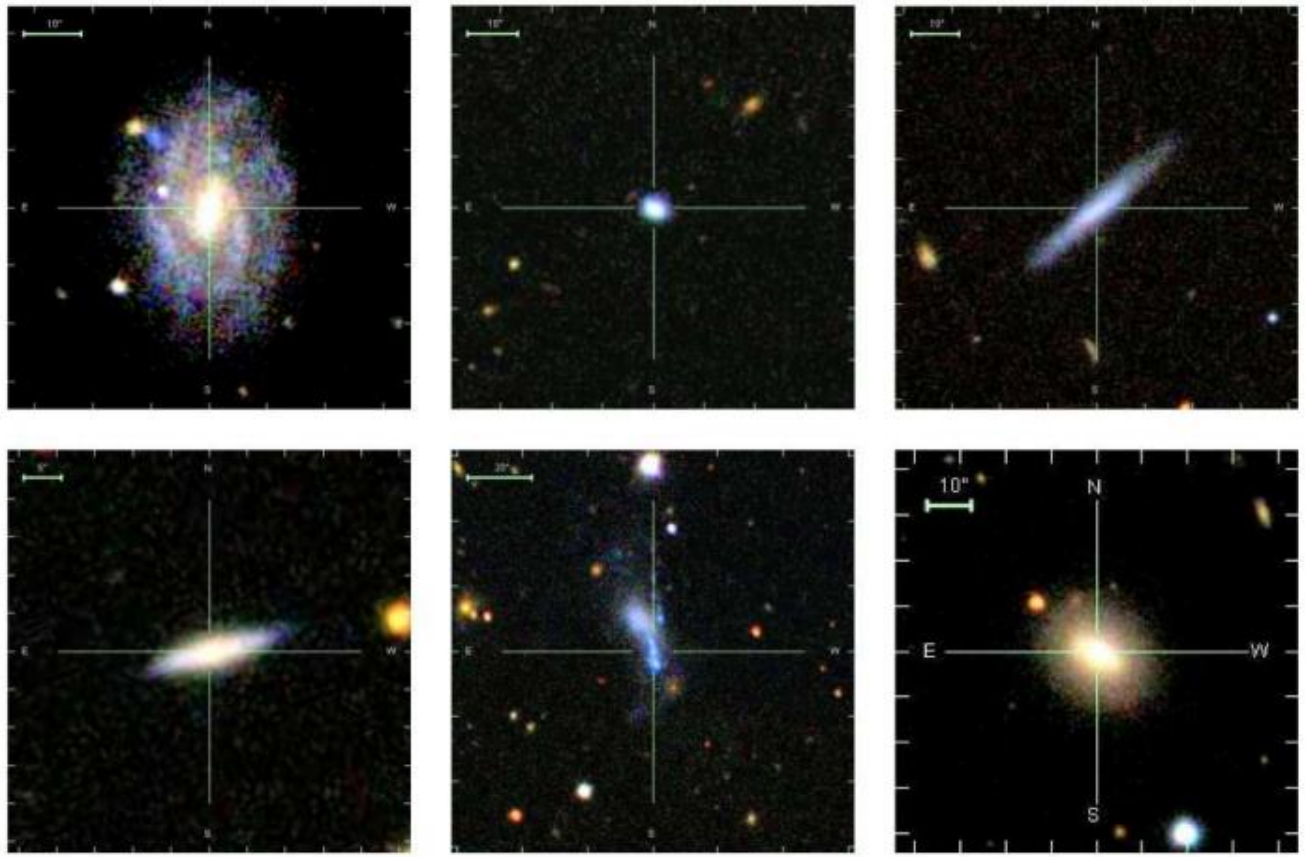


Figure 2. Sample VGS galaxies, all at the same physical scale, display a range of colors and morphologies (Kreckel et al. 2012).

[2]

Why study void galaxies?

- Voids correspond to cooler regions of the cosmic microwave background
- Void galaxies have some different properties than galaxies in clusters
  - Structures form early and without neighboring interactions
    - Gives us a look at galaxy formation
  - Higher stellar formation rate
- Have some similar properties
  - Percentage of active galactic nuclei

Our Goals

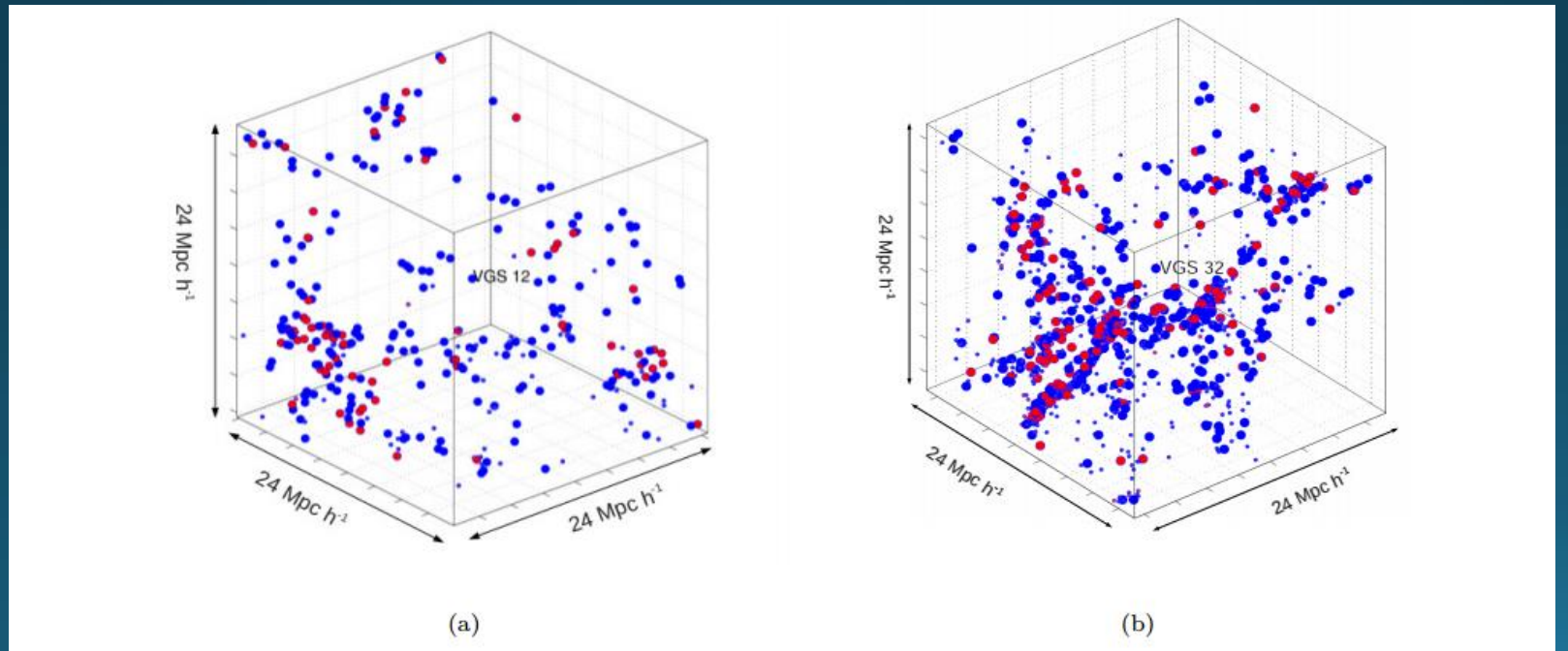
- Use Sloan Digital Sky Survey Data (SDSS), WiggleZ, and void catalog to identify void galaxies
- Study their spectral properties and follow up on interesting preliminary results

[3]

[4]

In Conclusion

- Void galaxies have some properties which vary from galaxies in clusters, some which are the same
- They have not been studied much—there is still much more we could learn
- Could provide insight into galaxy formation and evolution, the large scale structure of the universe, and active galactic nuclei



[5]

Questions?

Image Sources

[1] : https://www.sciencedaily.com/releases/2015/12/151202132934.htm

[2]: https://arxiv.org/abs/1410.6597

[3]: https://www.universetoday.com/17162/sloan-digital-sky-survey-changing-how-scientists-and-the-public-do-astronomy/

[4]: http://oldweb.aao.gov.au/images/captions/aat001.html

[5]: https://arxiv.org/abs/1601.08228