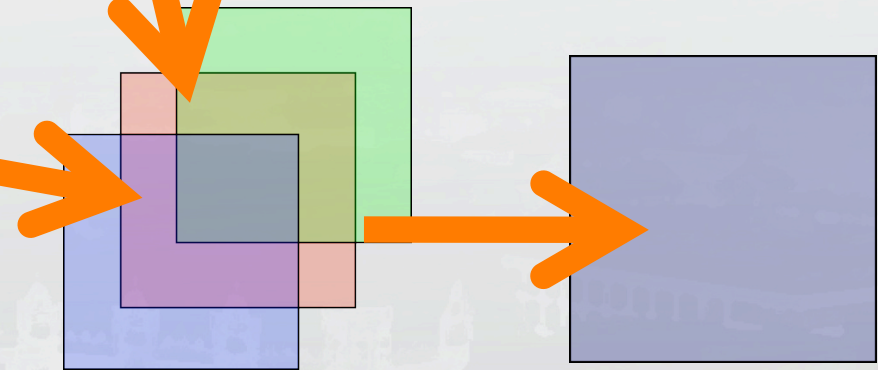
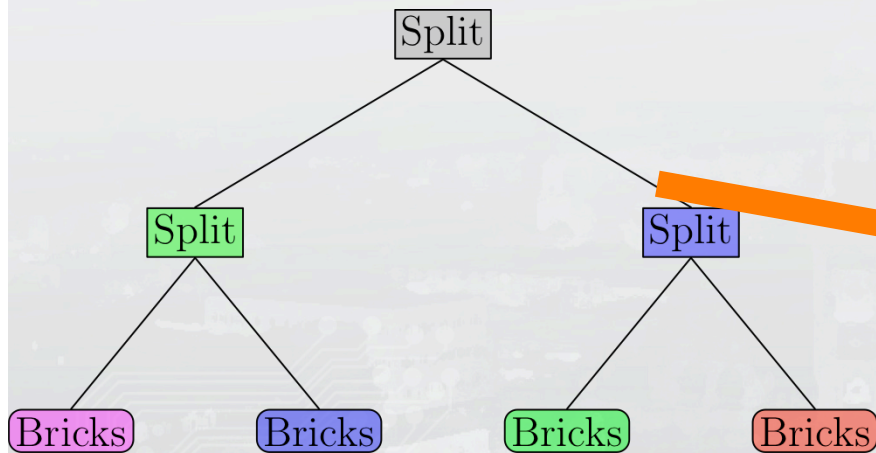
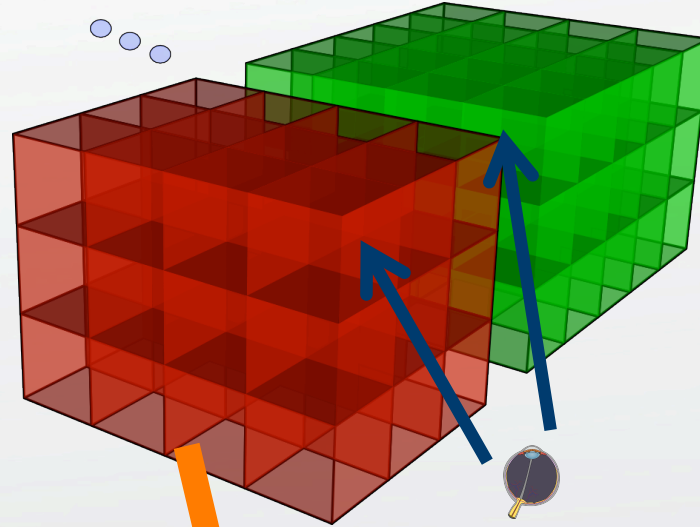
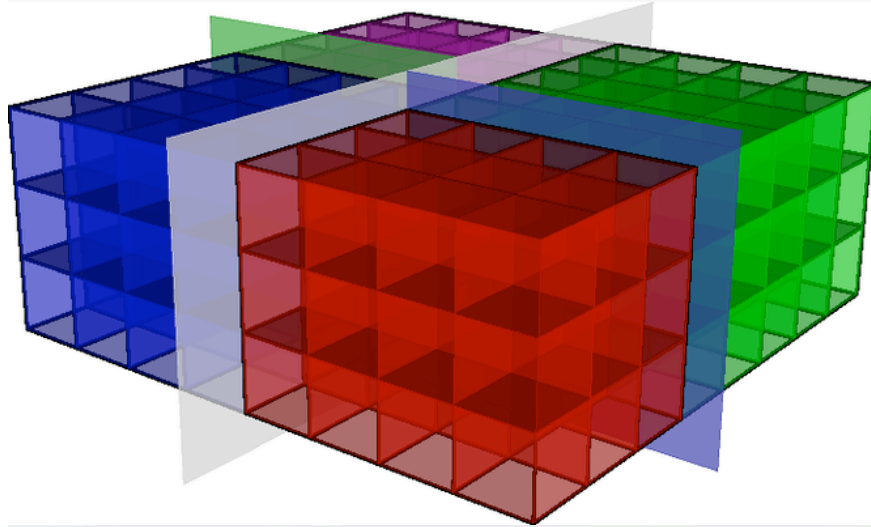
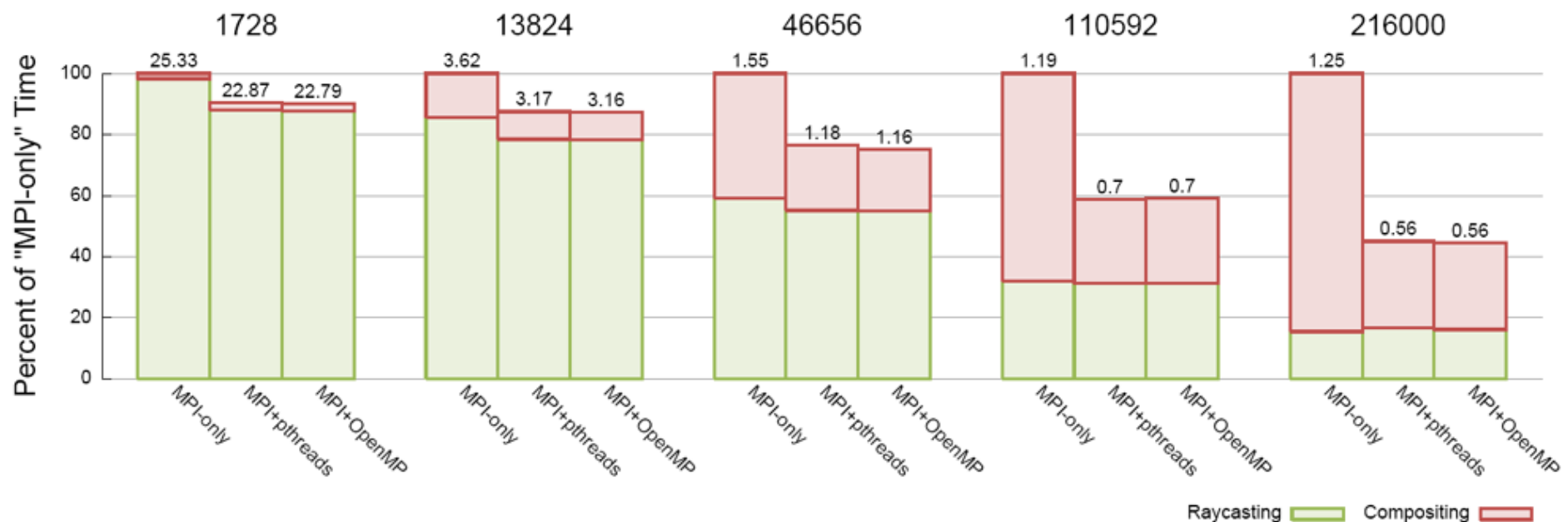


# Parallel Volume Rendering



# Volume Rendering Scalability

- Need lots of cores to render at acceptable speeds



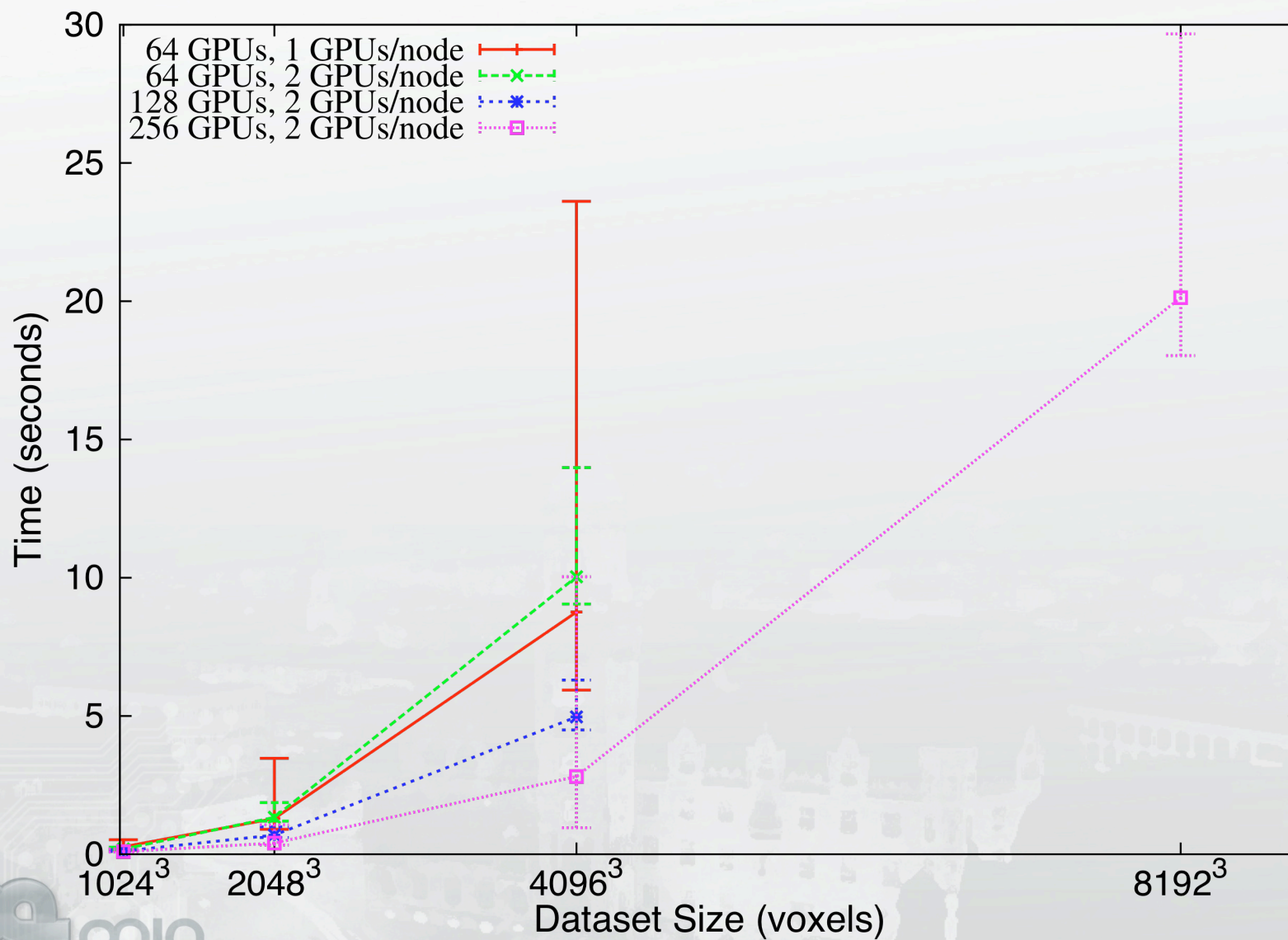
- Figure: Howison, Bethel, Childs, *MPI-hybrid Parallelism for Volume Rendering on Large, Multi-core Systems*, EGPGV 2010

# Longhorn





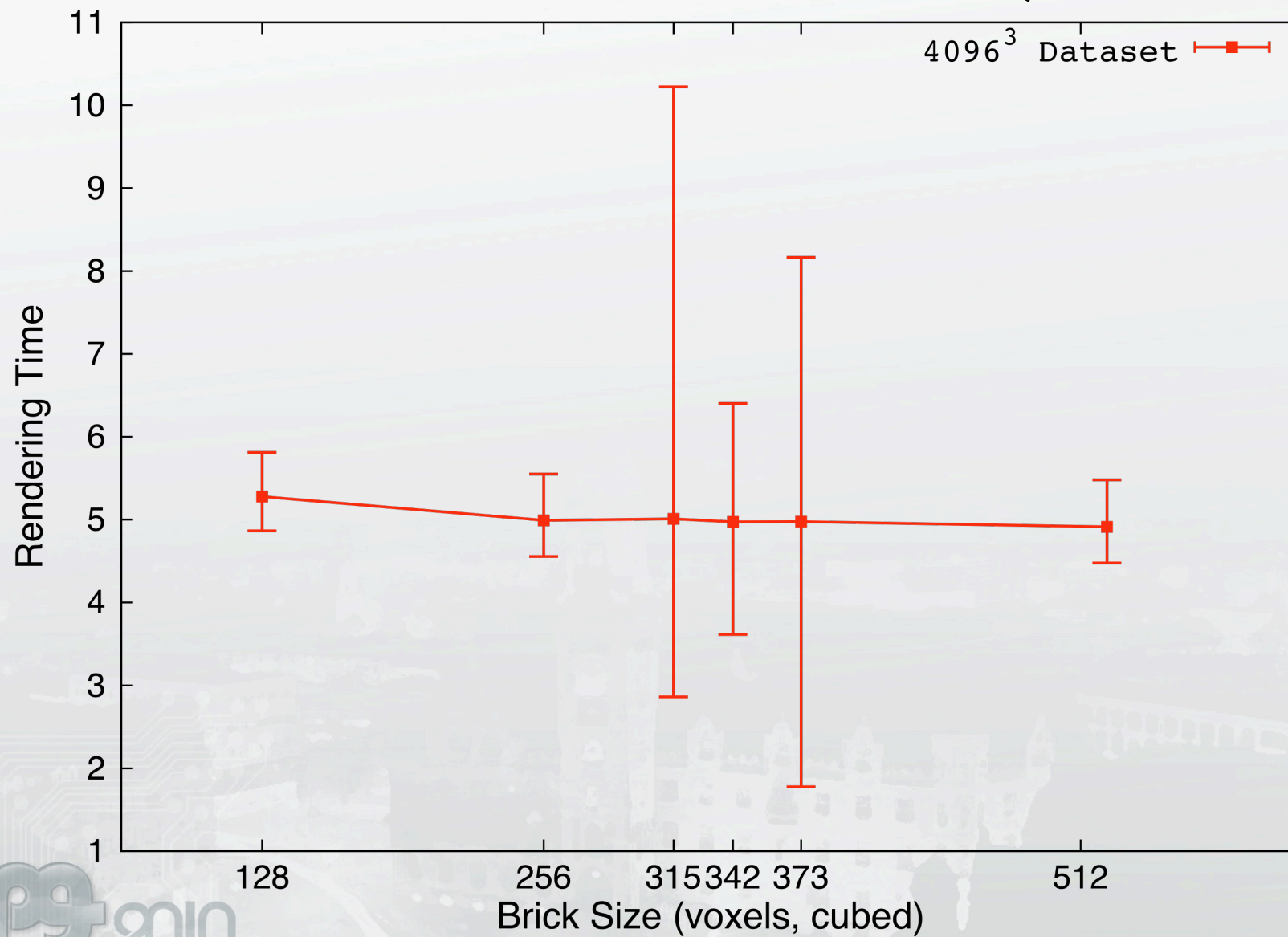
# Performance



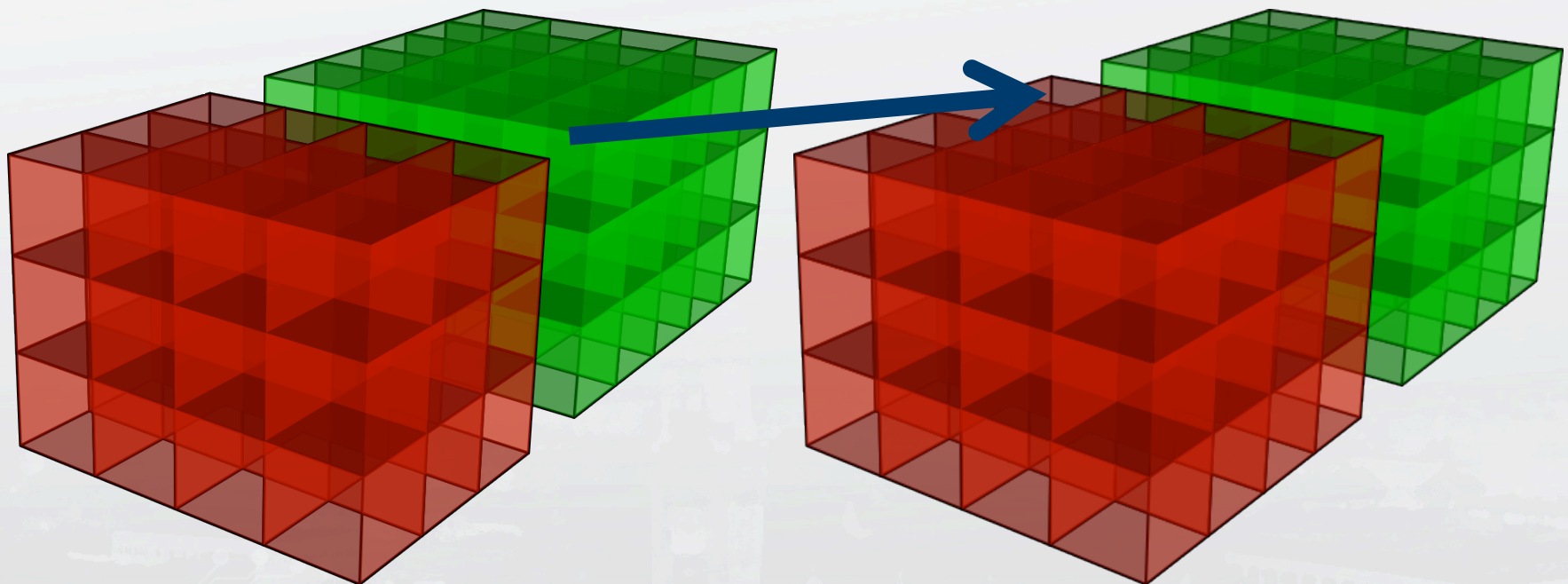
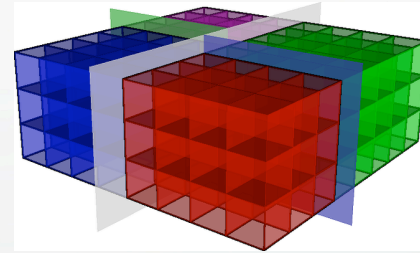


# Brick Size

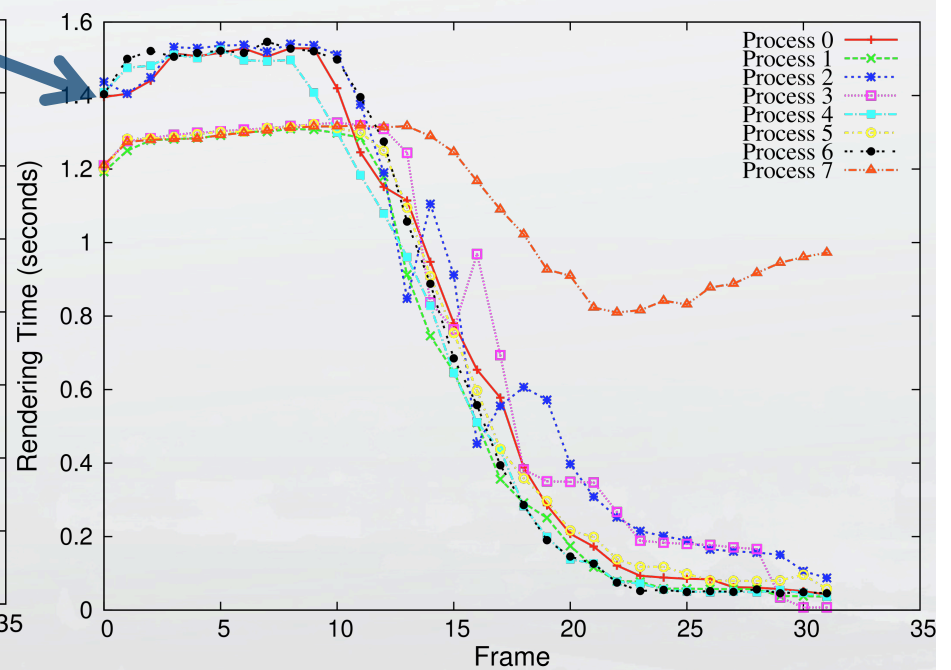
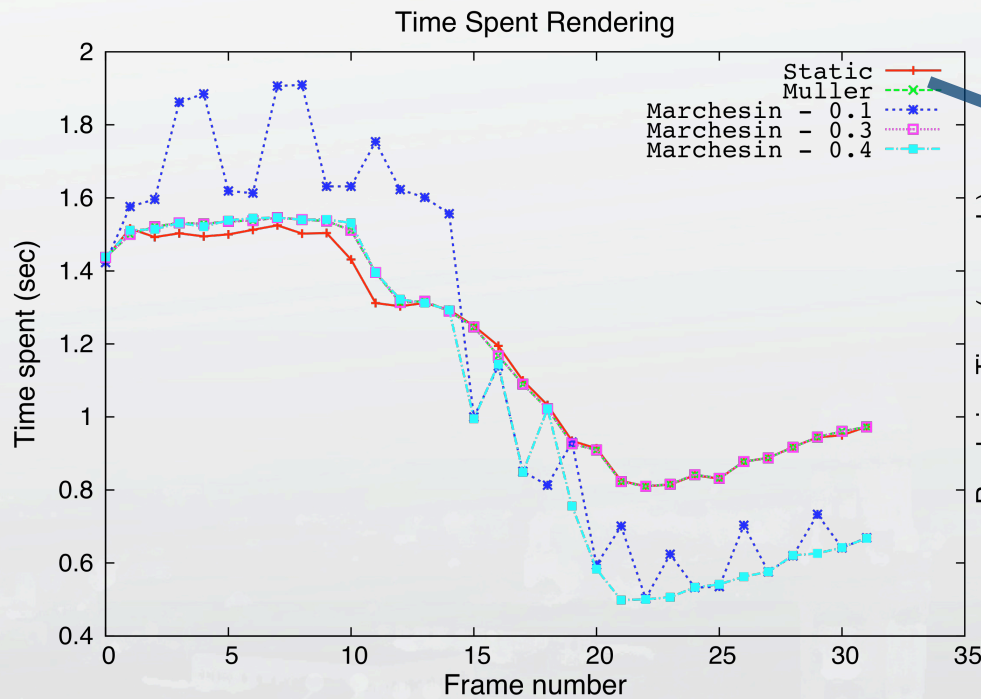
NVIDIA Quadro FX 5800's



# Dynamic Load Balancing



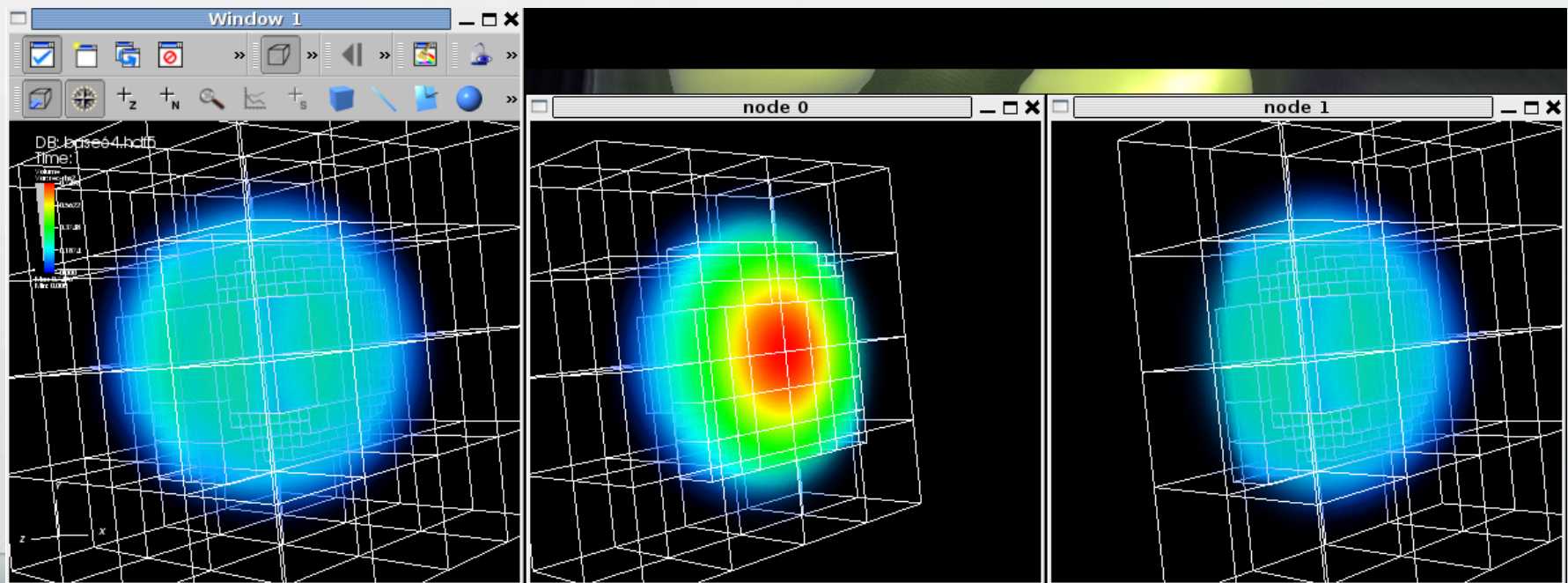
# Load Balancing





# Future Work - AMR

- "Adaptive mesh refinement" data
  - some spatial regions have higher-resolution
  - coarse/fine boundaries: sampling
  - uneven load distribution



# Thanks

- Funding
  - VACET
  - CIBC
  - C-SAFE
  - MMCI (Saarland University)
- Resources
  - TACC
  - ORNL
- Open source communities: GLEW, Mesa, VisIt
- Anonymous reviewers
- You!

The background of the slide is a faded, grayscale image of a cityscape. A large, ornate cathedral with multiple spires is the central focus. In the bottom left corner, there is a semi-transparent graphic of a circuit board. The word "Questions?" is centered in a large, bold, black font.

# Questions?