SAND2022-11463C

*Exceptional service in the national interest*

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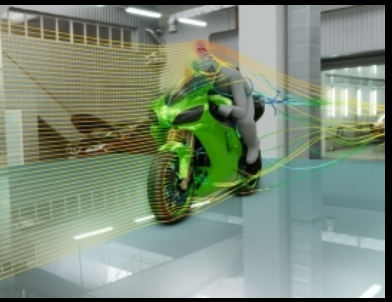

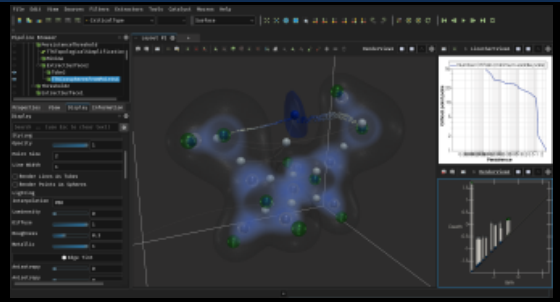
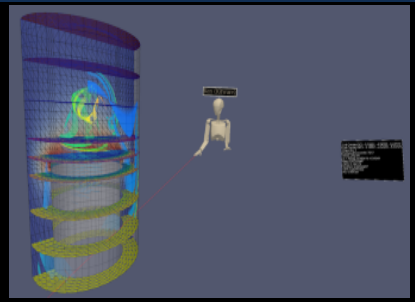

# What's New in ParaView

## DOECGF 2022

August 30, 2022

Mark Bolstad Sandia National Laboratories

with lots of contributions from Cory Quammen and the ParaView Community

U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration | CCR Center for Computing Research

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# Acknowledgements


- This research was supported by the Exascale Computing Project (17-SC-20-SC), a collaborative effort of two U.S. Department of Energy organizations (Office of Science and the National Nuclear Security Administration) responsible for the planning and preparation of a capable exascale ecosystem, including software, applications, hardware, advanced system engineering, and early testbed platforms, in support of the nation's exascale computing imperative.
- Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525.
- **Thanks to many, many partners in labs, universities, and industry.**

# The Numbers

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- Releases during the last 12+ months: 5.9.1 (May 2021), 5.10.0 (January 2022), 5.10.1 (March, 2022)
- Users at Sandia
  - ~250/month (DART metric: 2+ uses, non-support)
  - ~500 total during 2022 (unclassified use only)
- Downloads from Kitware past year: >550K
  - Counts button clicks on web form
  - Duplicate IP's removed
  - Includes binary and source packages. Not data nor plugins
- Total posts made to discourse the past year: 7.8K

# Sandia Monthly ParaView Usage

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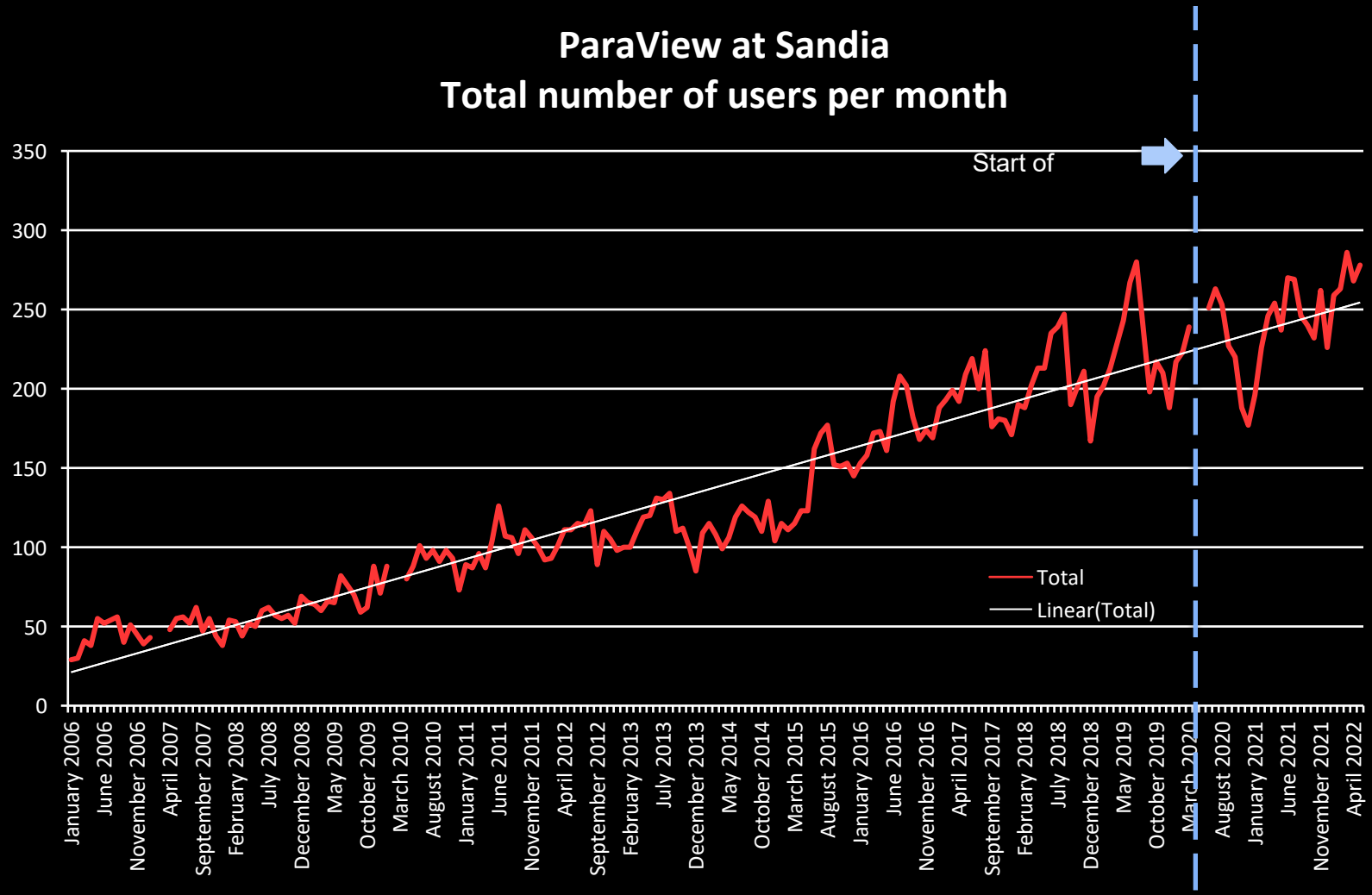

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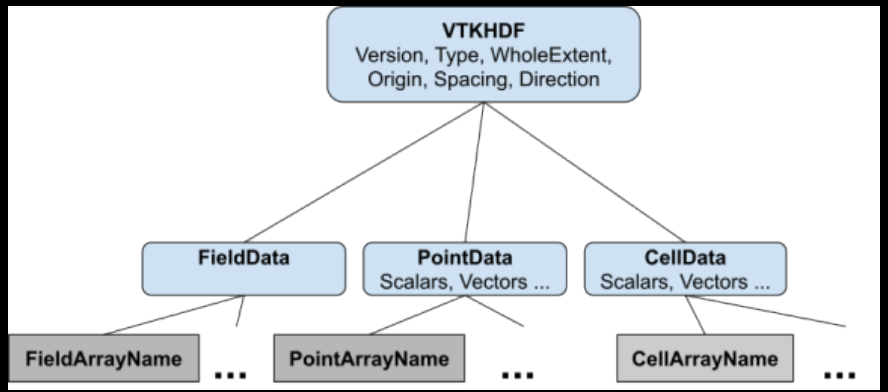
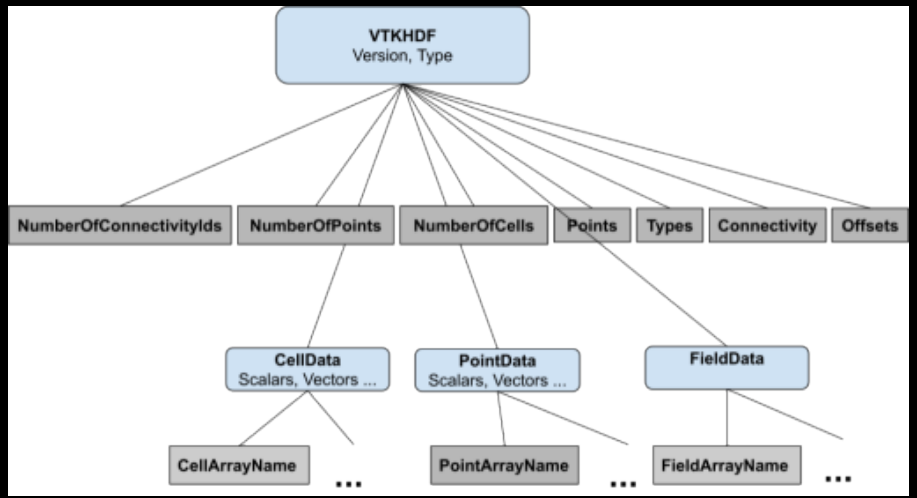
# Data Management Improvements

# VTK HDF format

- Storing VTK data in HDF is complicated because HDF does not have a **standard** way to attach meaning to its arrays
- Traditionally the method was to use XDMF
  - Need to write XML (light-weight data)
  - Not actively maintained
- So, created VTKHDF to address the issue



# Others

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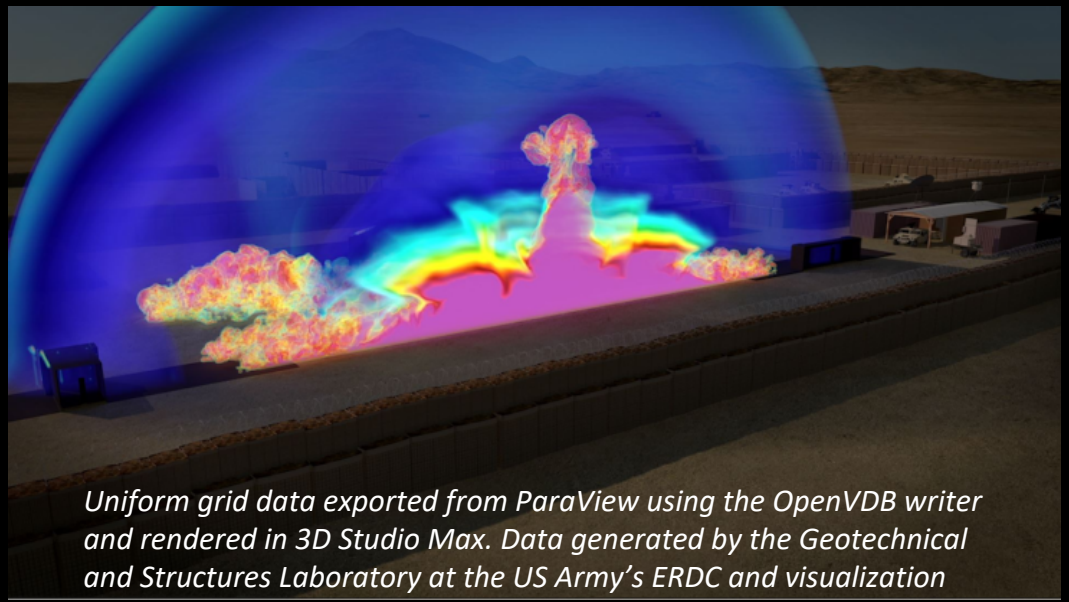
- IOSS Improvements
  - Writer for Exodus files (beta)
  - Reader now shows block/set ids in the Blocks/Sets selection widgets shown on the *Properties Panel*.
- OpenVDB Reader (5.11)/Writer (5.10)
  - Allows for interchange between DCC tools/OmniVerse and ParaView



*Uniform grid data exported from ParaView using the OpenVDB writer and rendered in 3D Studio Max. Data generated by the Geotechnical and Structures Laboratory at the US Army's ERDC and visualization generated by the US DoD HPCMP.*

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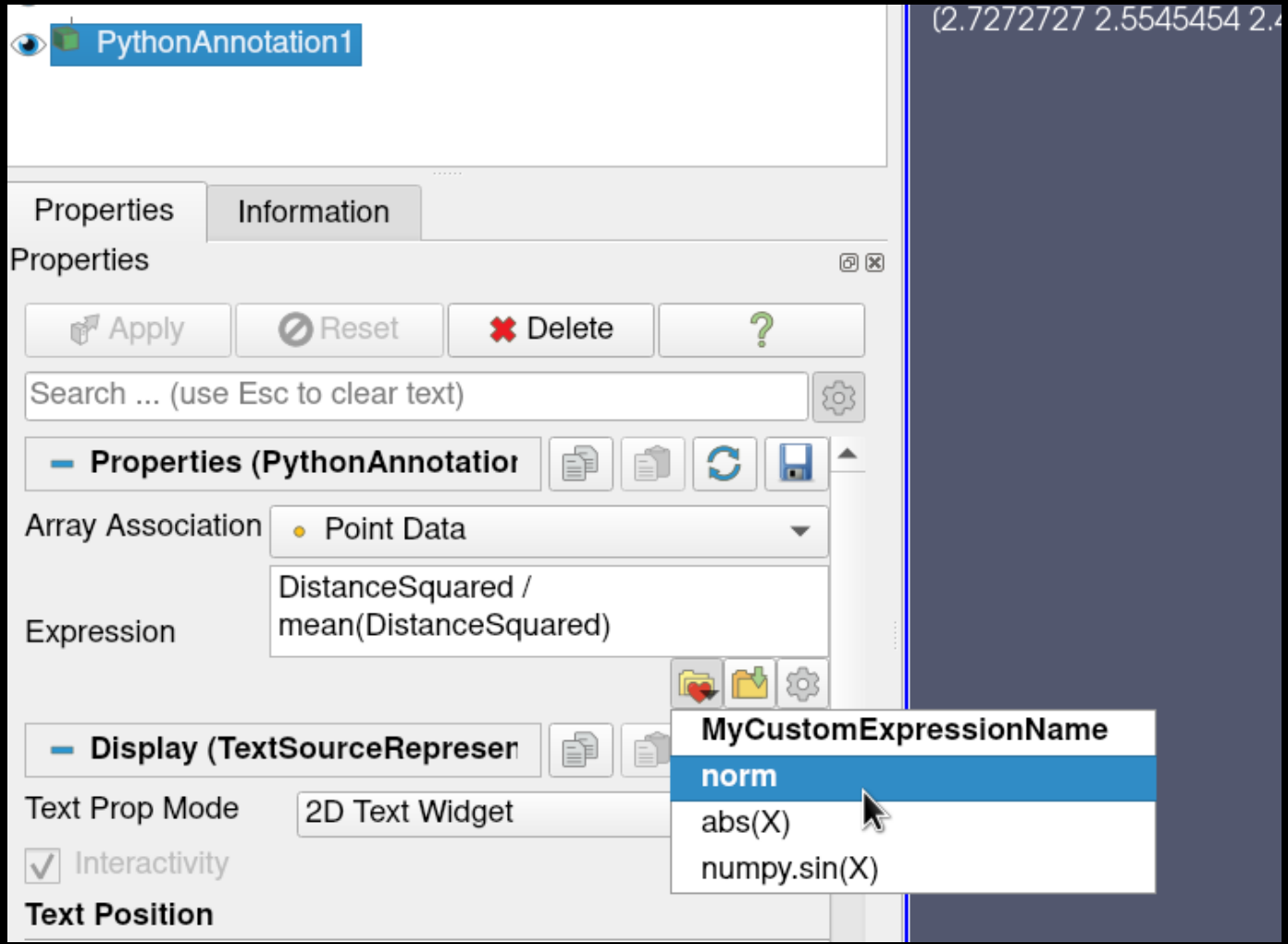
# User Interface Improvements

# Expression Manager



# Selection Editor

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Selection Editor

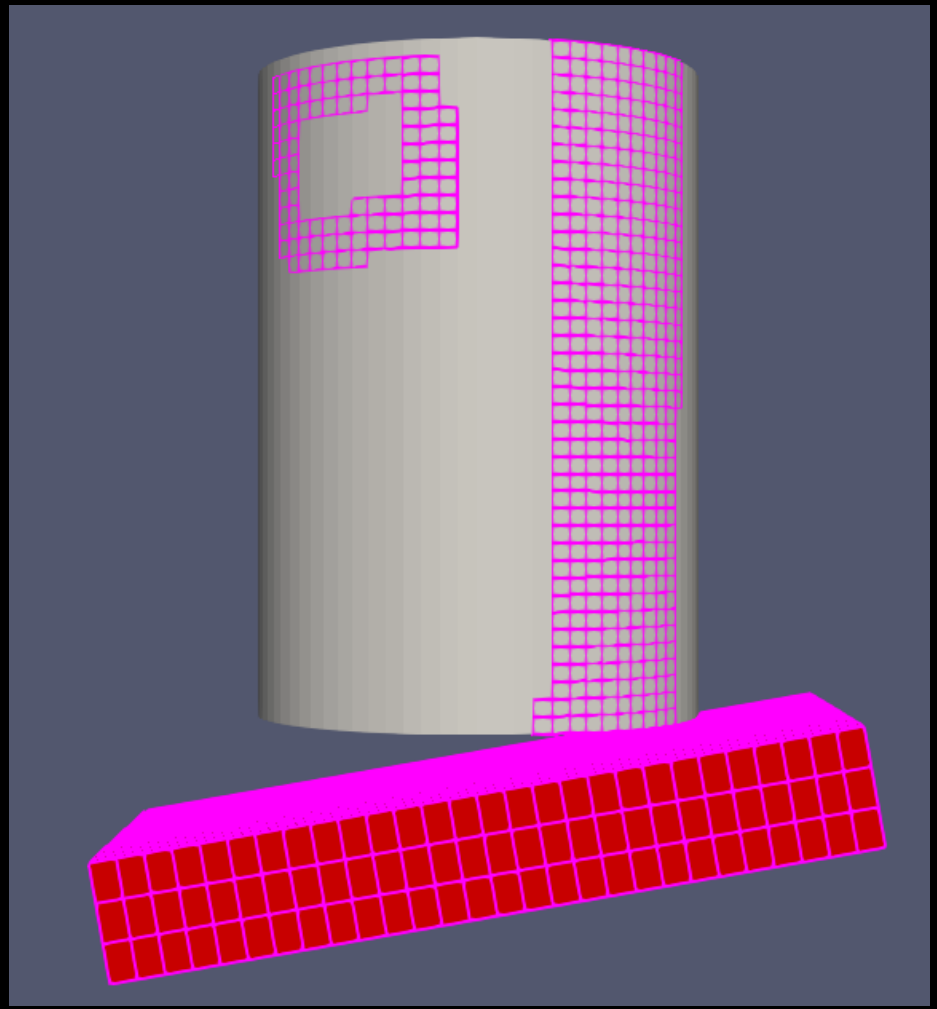
Data Producer: can.ex2

Element Type: Cell

Expression: s1|(s0^s2)|s3

| | Name | Type |
|---|---|---|
| 1 | s0 | Frustum Selection |
| 2 | s1 | Block Selectors Selection |
| 3 | s2 | Composite ID Selection |
| 4 | s3 | Query Selection |

Activate Combined Selections



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# Rendering Improvements

# Volume Rendering with Scattering Model

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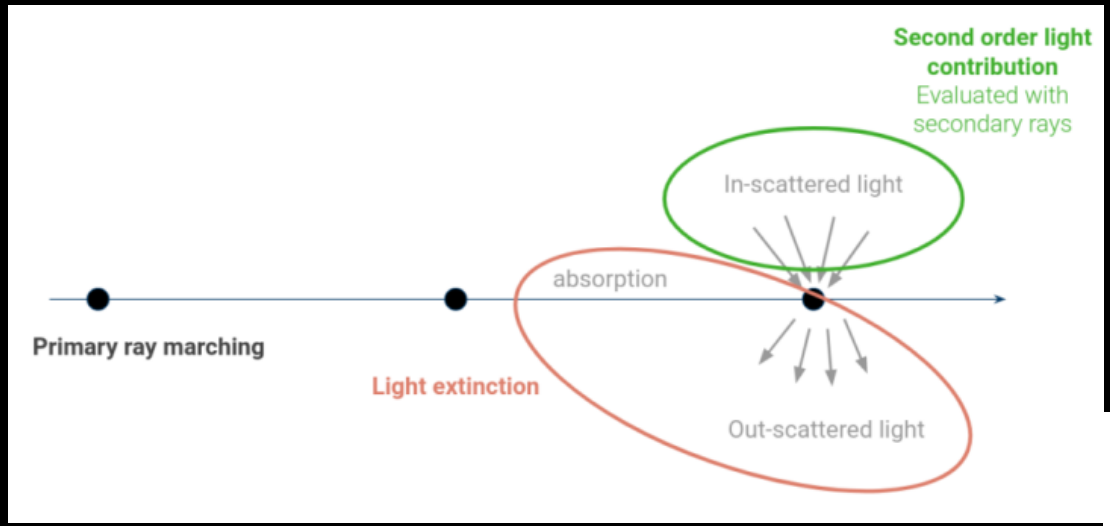


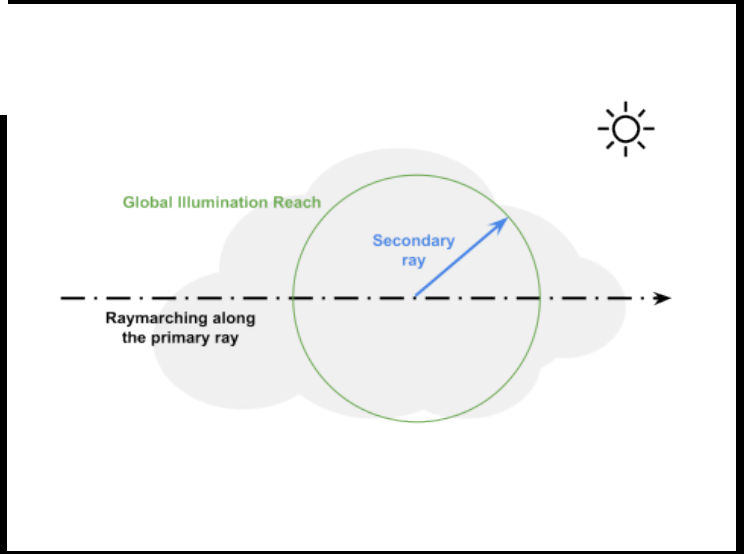

# Volume Rendering with Scattering Model

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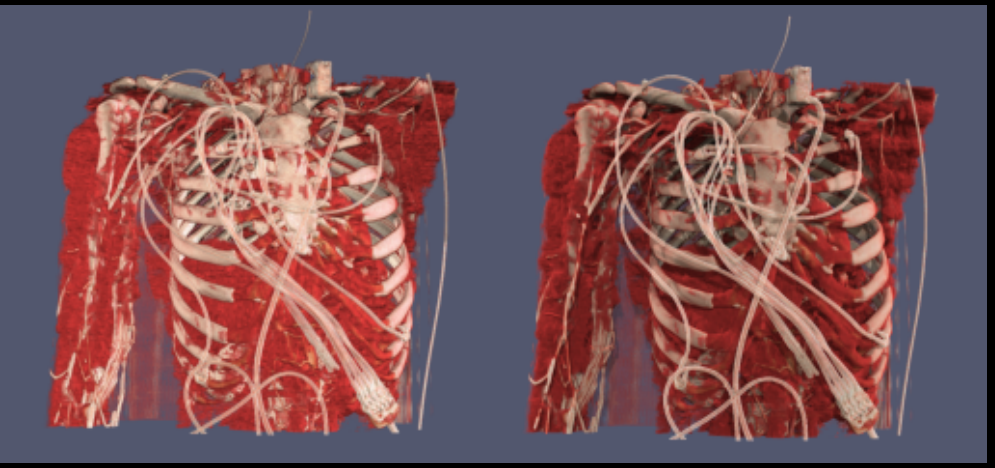

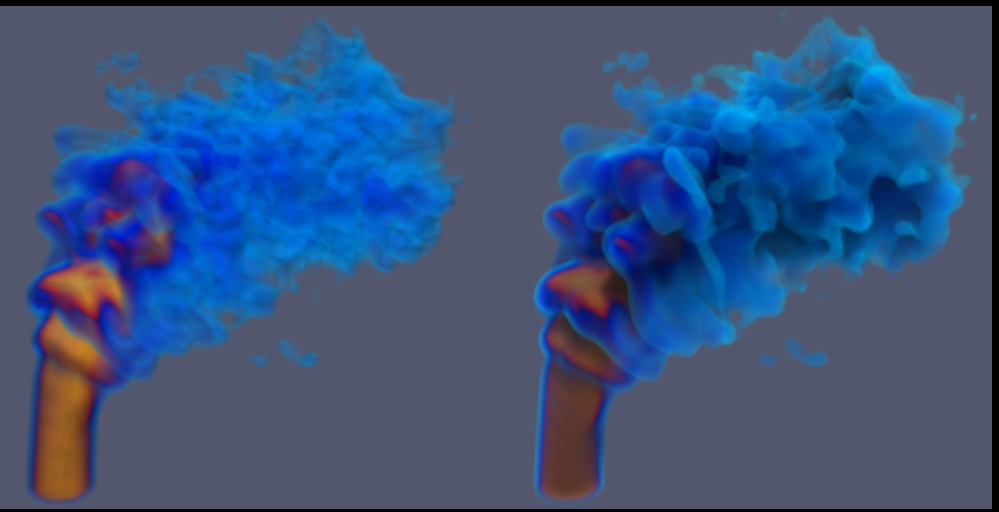

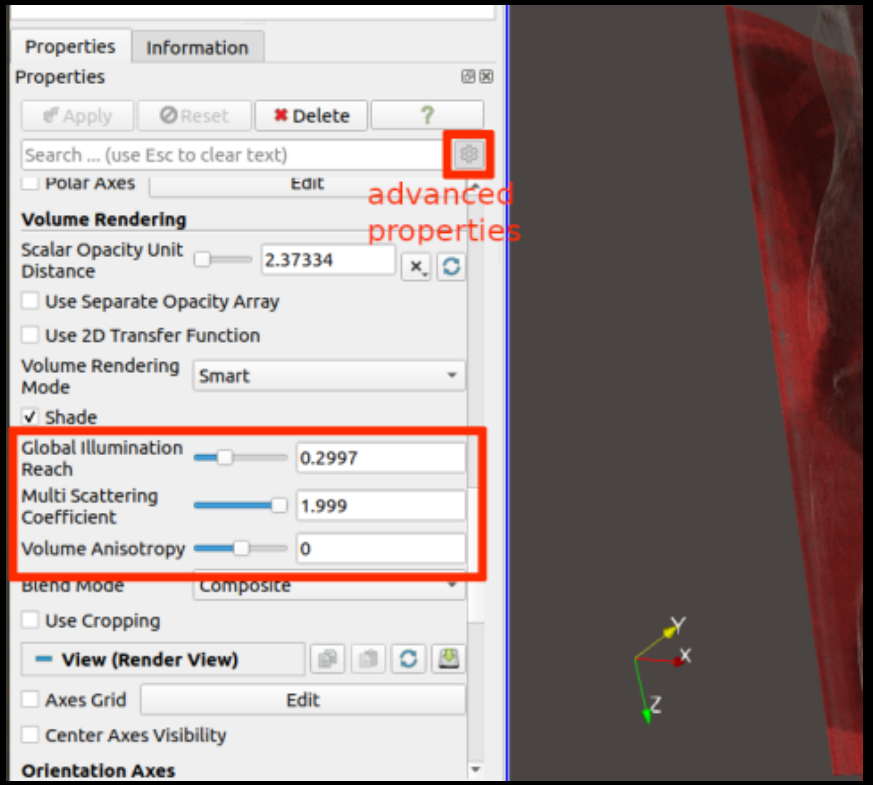

# 2D Transfer Functions

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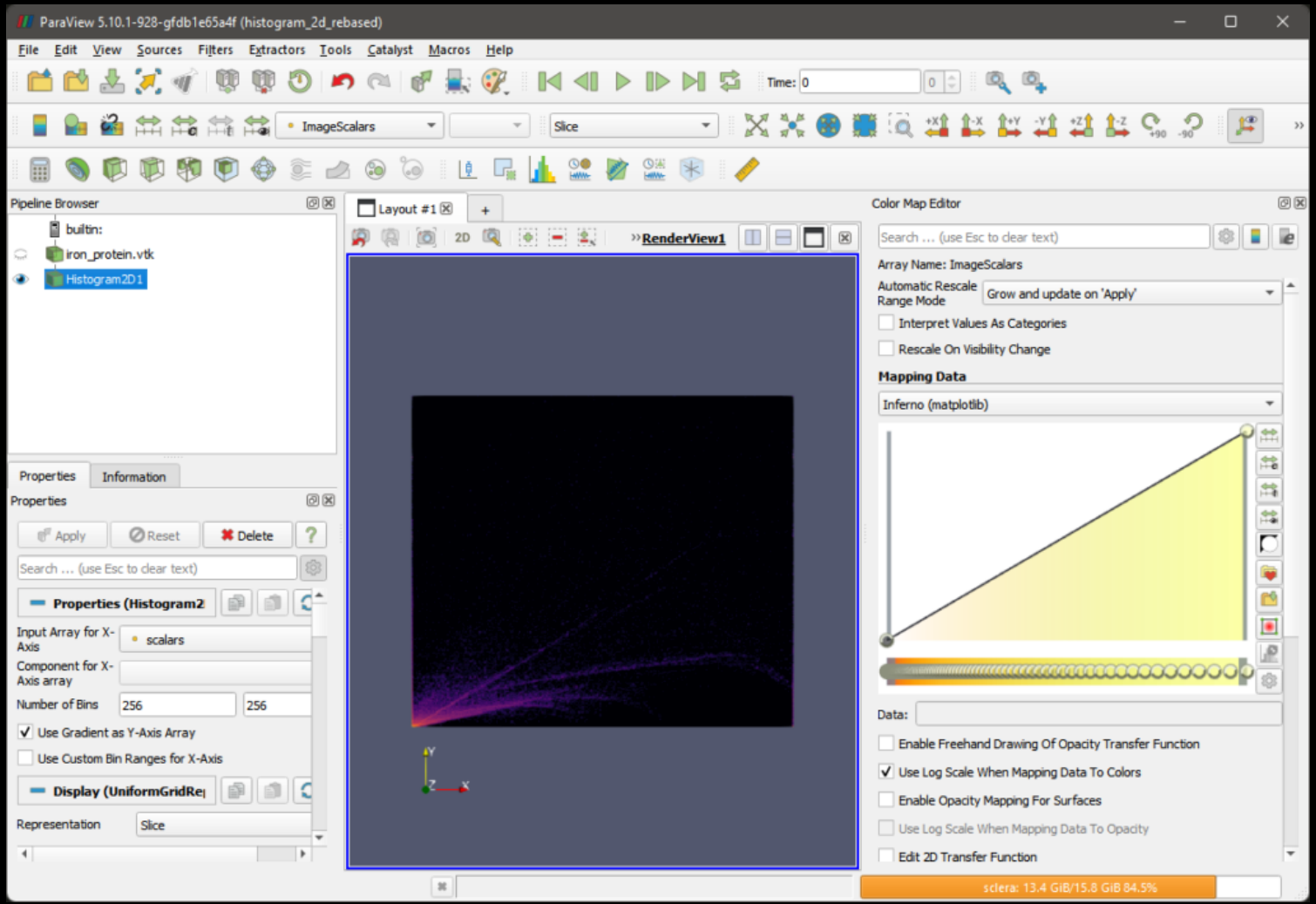

# 2D Transfer Functions

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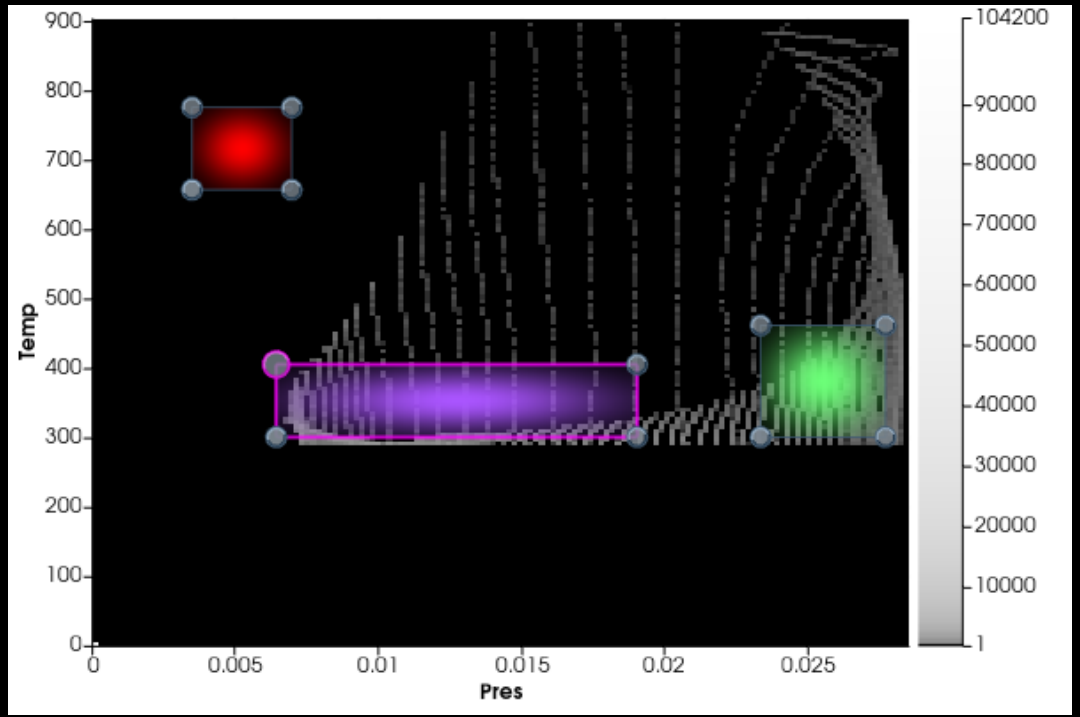


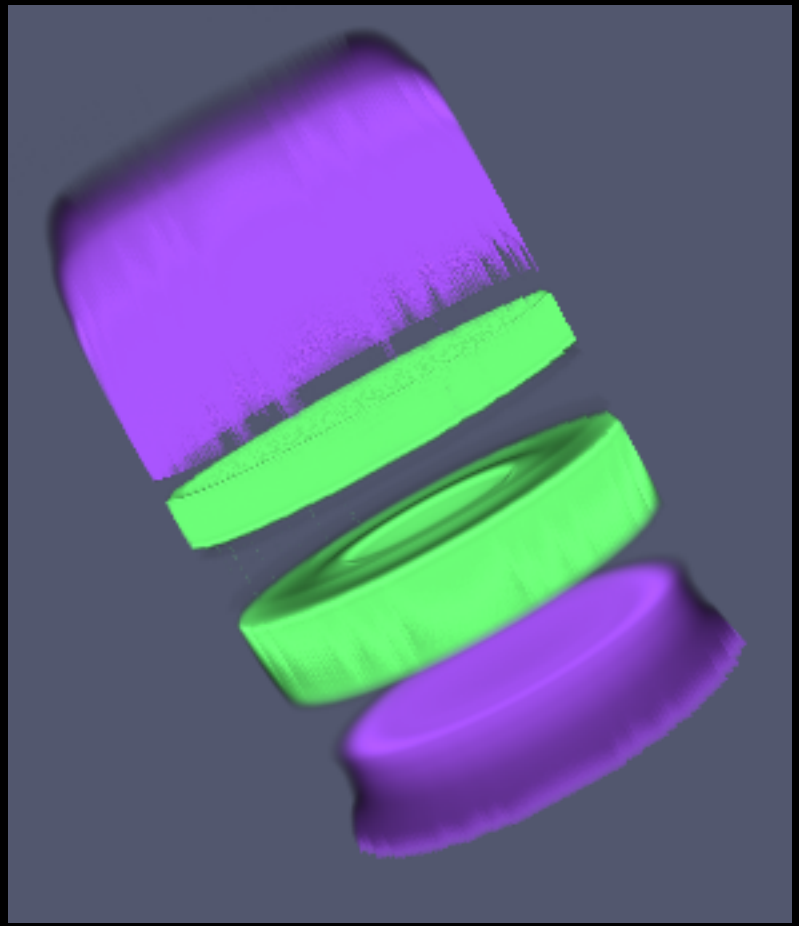

# 2D Transfer Functions (backpack dataset)

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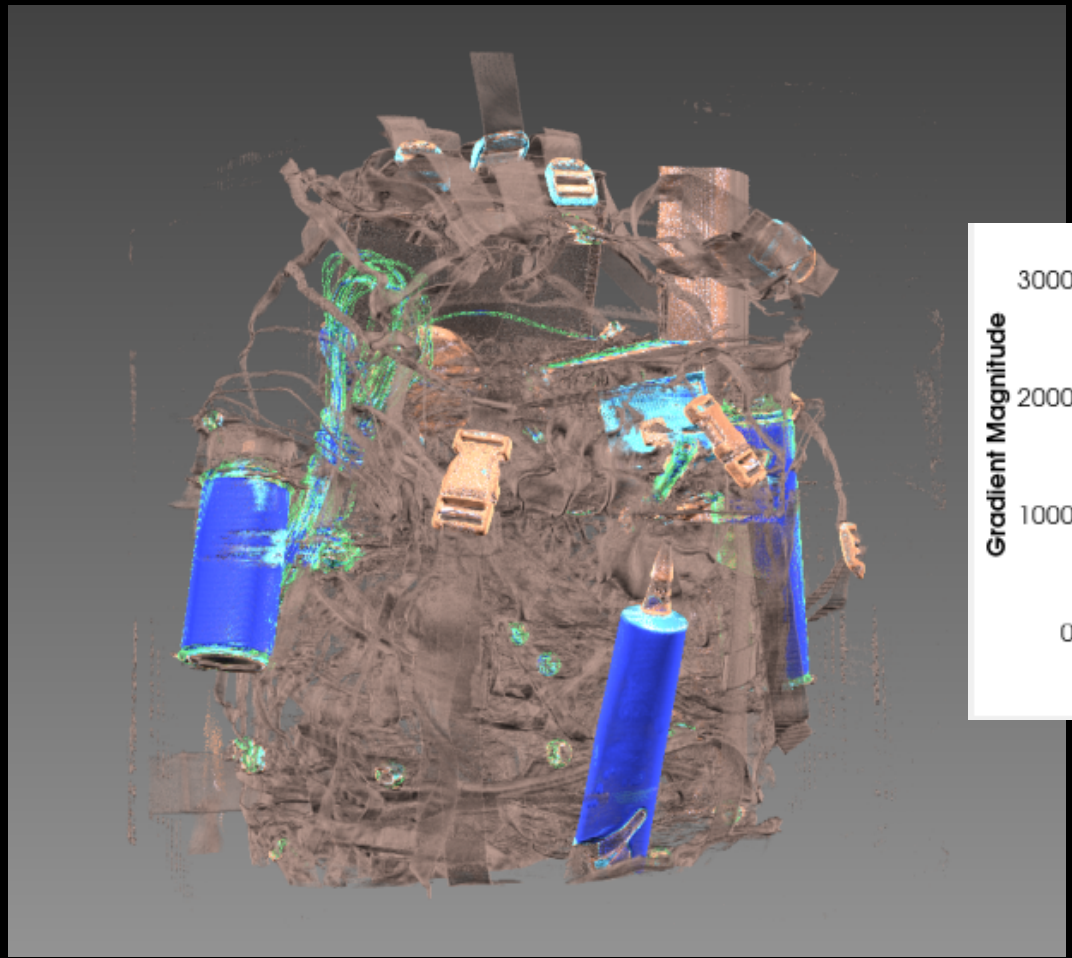

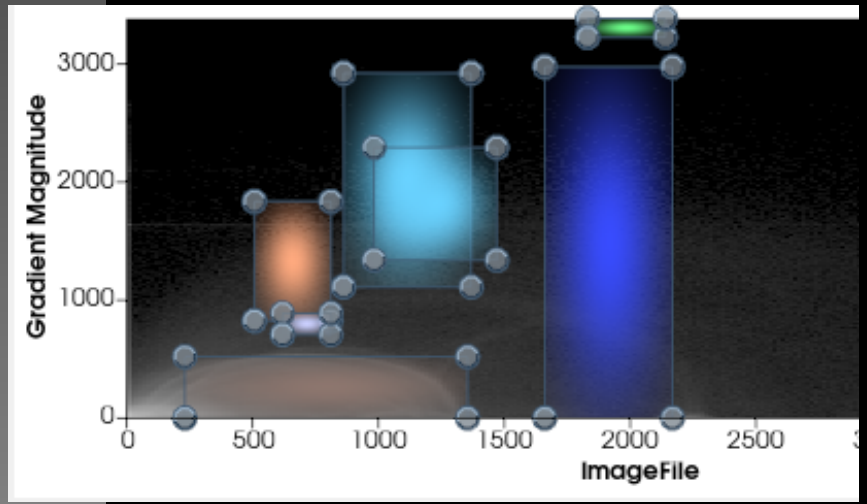

# Lots More Features/Fixes

- https://www.kitware.com/tag/paraview/

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