



## Carnegie Mellon Graphics Colloquium

Thursday, 20 November 2025

4:30–5:30pm

Rashid Auditorium, Gates Hillman 4401

# OpenVDB

Ken Museth

Senior Director of Physics Research, NVIDIA

As the inventor of VDB and founder of OpenVDB, I am excited to talk about its history, motivation, and diverse adoption. Specifically, this lecture will cover the underlying VDB data structure, and its adoption to computer graphics, physics simulations and more recently machine learning. Since its open-source release in 2012, OpenVDB has become an industry standard and has been used in numerous VFX franchises like “Avatar”, “Avengers”, “The Mummy”, “Pirates of the Caribbean”, “Kung Fu Panda”, and “How to Train Your Dragon”. It is adopted by numerous commercial software packages used by the entertainment industry, including Houdini, RenderMan, Arnold, Blender, and Unreal Engine, just to mention a few. OpenVDB has also found use in many areas outside of media and entertainment, including SLAM, autonomous driving, topology optimization, semiconductor designs, 3D printing, medical imaging, rocket design, aerial surveillance, robotics, and many machine learning applications. Finally, OpenVDB was the first open-source project to be adopted by the Academy Software Foundation (ASWF) and the Linux Foundation (in 2018).

Bio: Ken Museth is Sr Director of the High-Fidelity Physics Research team at Nvidia and chair of the Technical Steering Committee for OpenVDB under the Academy Software Foundation. He has a PhD in quantum physics from Copenhagen University and did his postgraduate studies in computer science at Caltech. Previously he was a Sr. Computational Scientist at SpaceX for six years, working on CFD simulations of the Raptor engine, Head of Simulation R&D at Weta FX for three years, working on James Cameron’s Avatar 2, director for FX and CFX simulation teams at DreamWorks Animation for eight years, Sr Software Engineer at Digital Domain for three years, full tenured professor in computer graphics at Linköping University for four years, where he supervised five PhD and 15 MSc students, and research scientist at NASA’s Jet Propulsion Laboratory for three years, working on space-mission design and visualization. Ken invented and founded OpenVDB for which he won two Academy Awards from the Academy of Motion Picture Arts and Sciences; a Technical Achievement Award (Academy Certificate) in 2015 and a Scientific & Engineering Award (Academy Plaque) in 2024. Additionally, in 2023 he was awarded the ACM SIGGRAPH Practitioner Award and was accepted into the ACM SIGGRAPH Academy. Ken has served on the Technical Papers Committee for ACM SIGGRAPH multiple times and has 29 movie credits, including on franchises like “Avatar”, “Avengers”, “The Mummy”, “Pirates of the Caribbean”, “Kung Fu Panda”, and “How to Train Your Dragon”.



Web Page: <https://research.nvidia.com/labs/prl/author/ken-museth/>

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→ <http://graphics.cs.cmu.edu>