

# Julian Bellavita

COMPUTER SCIENCE PHD STUDENT AT CORNELL UNIVERSITY · DOE CSGF FELLOW

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## Education

### Cornell University

PHD, COMPUTER SCIENCE

- Advisor: Dr. Giulia Guidi
- Concentration: Scientific Computing
- GPA: 3.98

Ithaca, NY  
08/2023 - present

### University of California, Berkeley

BA, COMPUTER SCIENCE

- Major GPA: 3.97

Berkeley, CA  
08/2019 - 05/2023

## Research Experience

### Graduate Researcher, Cornell University

ADVISOR: DR. GIULIA GUIDI

Large-scale multi-GPU clustering with sparse linear algebra. Parallelizing sparse linear algebra kernels. Randomized CP decomposition.

Ithaca, NY  
08/2023 - Present

### Graduate Researcher, Oak Ridge National Laboratory

ADVISOR: DR. RAMAKRISHNAN KANNAN

Mixed precision tensor processing kernels on GPUs.

Oak Ridge, TN  
05/2025 - 08/2025

### Visiting PhD Student, University of Trento

ADVISOR: DR. FLAVIO VELLA

Kernel k-means on GPUs with sparse linear algebra.

Trento, Italy  
01/2024 - 08/2024

### Undergraduate Researcher, University of California, Berkeley

ADVISOR: DR. JAMES DEMMEL

Generating BLAS 3 kernels for vector architectures via user-scheduled compilers.

Berkeley, CA  
05/2022 - 05/2023

### Student Research Assistant, Lawrence Berkeley National Lab

PAGODA PROJECT – CLASS GROUP

Task-based formulation of sparse Cholesky decomposition with GPU acceleration.

Berkeley, CA  
2022-2023

### Student Research Assistant, Lawrence Berkeley National Lab

SCIENTIFIC DATA MANAGEMENT GROUP

Studying access patterns of high-energy physics datasets on distributed storage systems.

Berkeley, CA  
2021-2023

## Publications

**Julian Bellavita**, Thomas Pasquali, Laura Del Rio Martin, Flavio Vella, and Giulia Guidi. 2025. "Popcorn: Accelerating Kernel Kmeans on GPUs through Sparse Linear Algebra". In The 30th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP 2025).

Thomas McFarland, **Julian Bellavita**, and Giulia Guidi. 2025. "Parallel GPU-Enabled Algorithms for SpGEMM on Arbitrary Semirings with Hybrid Communication". Short paper. In Proceedings of the 16th ACM/SPEC International Conference on Performance Engineering (ICPE 2025).

Adrián Castelló, **Julian Bellavita**, Grace Dinh, Yuka Ikarashi, Hector Martínez. "Tackling the Matrix Multiplication Micro-Kernel Generation with Exo." In IEEE/ACM International Symposium on Code Generation and Optimization (CGO 2024).

**Julian Bellavita**, Mathias Jacquelin, Esmond G. Ng, Dan Bonachea, Johnny Corbino, and Paul H. Hargrove. "symPACK: A GPU-Capable Fan-Out Sparse Cholesky Solver." In Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W 2023).

**Julian Bellavita**, Caitlin Sim, Kesheng Wu, Alex Sim, Shinjae Yoo, Hiro Ito, Vincent Garonne, Eric Lancon, "Understanding Data Access Patterns for dCache System." In 26th International Conference on Computing in High Energy & Nuclear Physics (CHEP 2023)

**Julian Bellavita**, Alex Sim, Kesheng Wu, Inder Monga, Chin Guok, Frank Würthwein, and Diego Davila. 2022. "Studying Scientific Data Lifecycle in On-demand Distributed Storage Caches." In Fifth International Workshop on Systems and Network Telemetry and Analytics (SNTA 2022).

Awards\_\_\_\_\_

FELLOWSHIPS

- 2024    **DOE Computational Science Graduate Fellowship (DOE CSGF)**, United States Department of Energy
- 2023    **Cornell Fellowship**, Cornell University

AWARDS

- 2024    **Best Student Presentation**, The 2nd CINI Summer School on. High Performance Computing and Emerging Technologies
- 2022    **2nd Place**, ACM/IEEE Student Research Competition, Undergraduate Division

GRANTS

- 2025    **NSF Student Travel Grant**, The 30th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP 2025)

Presentations\_\_\_\_\_

TALKS

- ”**Block Leverage Scores for Cache-Friendly Randomized CP Decomposition**”, RNLA Workshop at IPAM, 2025
- ”**Algorithms for Computing a Tensor Times Matrix Chain in Mixed Precision**”, Oak Ridge National Laboratory Discrete Algorithms Group Seminar, 2025
- ”**Multi-GPU Communication Schemes for Large-Scale Supercomputers**”, Cornell Systems Seminar, 2024
- ”**Accelerating High-Dimensional K-Means Clustering on GPUs with Sparse Matrix Multiplication**”, University of Trento, 2024
- ”**RDMA-Based Algorithms for Sparse Matrix Multiplication on GPUs**”, Cornell HPC Group, 2024
- ”**Portable code generation and semi-automatic scheduling for BLIS microkernels with Exo**”, BLIS Retreat, 2022

POSTERS

- ”**Mixed Precision Algorithms for Computing the Tucker Decomposition**”, CSGF Program Review, 2025
- ”**Efficient Large-Scale Multi-GPU Clustering using Sparse Linear Algebra**”, IPDPS PhD Form, 2025

Mentoring\_\_\_\_\_

- 2025    **Nolan Lizmi**, Undergraduate, Cornell University
- 2025    **Alexander Schatzberg**, Undergraduate, Cornell University
- 2024-2025    **Matthew Rubino**, MEng Student, Cornell University
- 2024-2025    **Nakul Iyer**, MEng Student, Cornell University
- 2024-2025    **Andrew Chang**, MEng Student, Cornell University
- 2024-2025    **Noam Benson-Tilsen**, Undergraduate, Cornell University
- 2024    **Thomas McFarland**, Undergraduate, Cornell University

Services\_\_\_\_\_

- 2025    **SPAA 2025**, Junior Program Committee Member
- 2025    **CGO 2025**, Artifact Review Committee Member