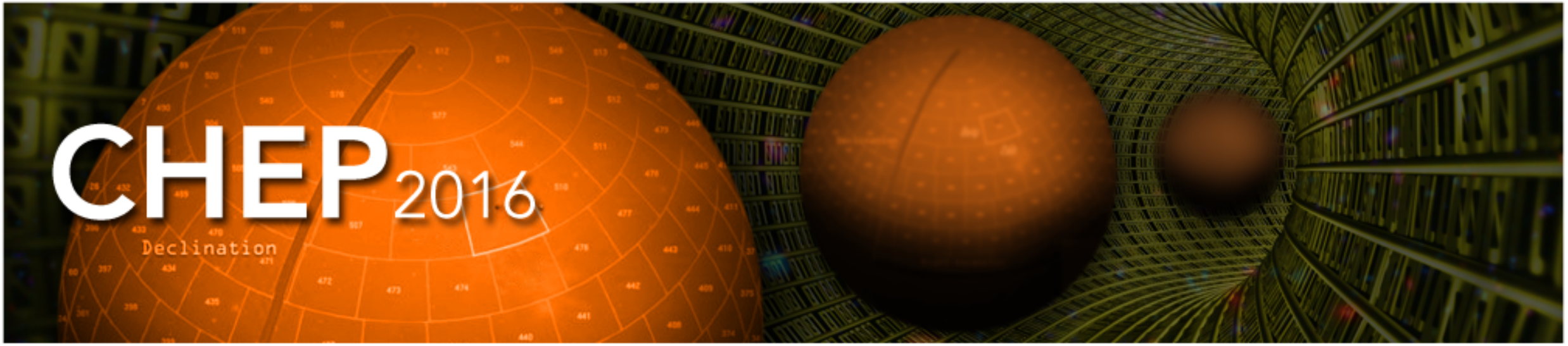

22nd International Conference on Computing in High Energy and Nuclear Physics, Hosted by SLAC and LBNL, Fall 2016

Performance of GeantV EM Physics Models

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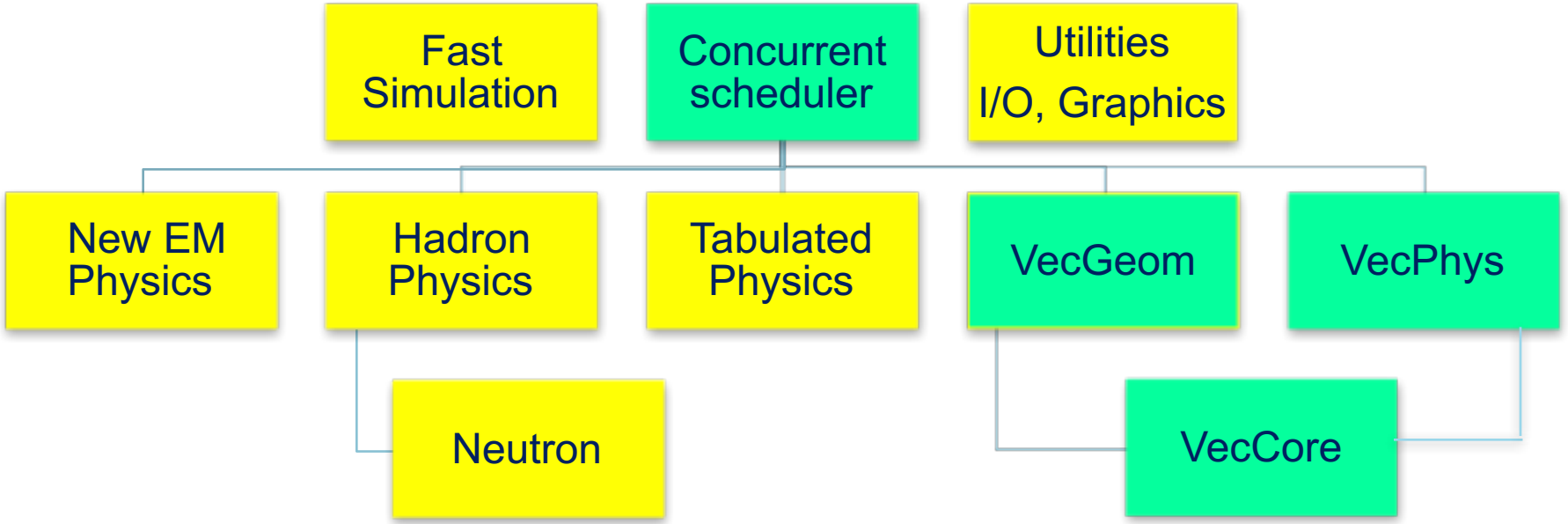
for the GeantV Development Team

Oct. 11, 2016
CHEP16@San Francisco

Future - Return of Vectors

- GeantV: new demonstrator in HEP Detector Simulation
  - Track-level-parallelism to leverage vectors and threads
  - Locality and ILP (vector pipeline)
  - Portable codes for the variety of computing models

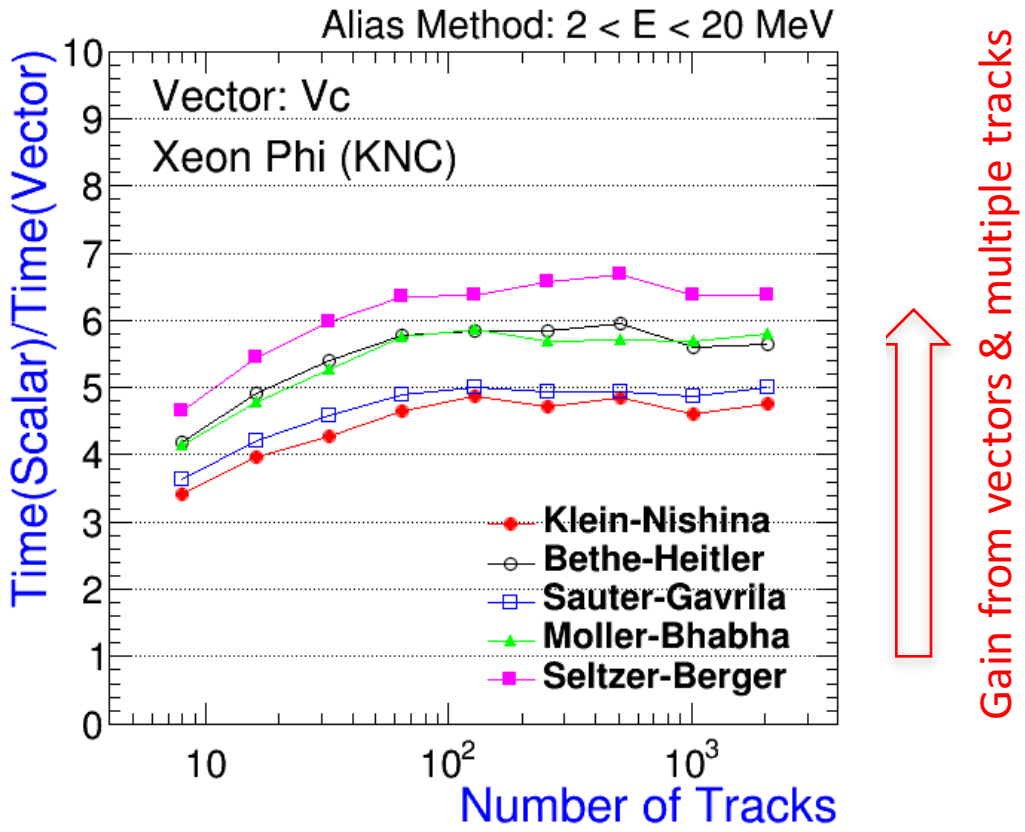


- GeantV EM physics: confluent-parallel paths
  - Develop new improved algorithms from the ground-up (New EM)
  - Vectorize EM physics models explicitly for SIMD/SIMT (VecPhys → this talk)

Performance of EM Physics Models on Intel KNC and NVidia Kepler (K20)

- KNL (Xeon Phi 5110P 60 cores @1.013 GHz): MIC (**8 vector** for double precision)
- K20 GPU (2496 cores @ 0.7GHz with blocks=26, threads) + Xeon E5 (1 core, 2.6GHz)

- Vector: Vc backend+ MIC



- CUDA: Scalar backend