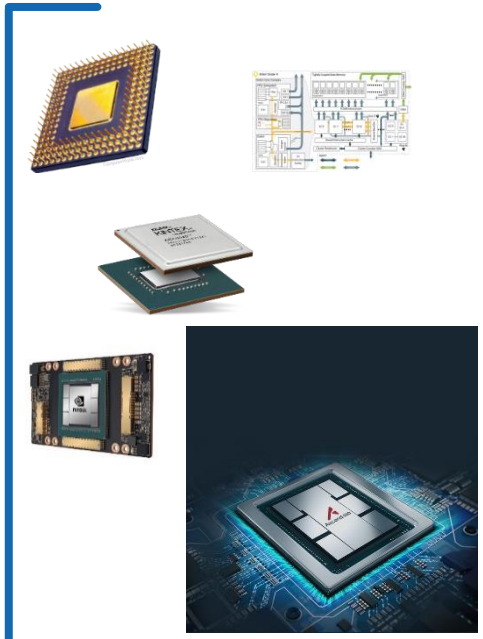
SoftHier DaCe Starting Plan



Transformations

- Loop to Map
- Loop & Map Fusion
- Loop & Map Fission
- Tiling
- Prototype transformations that expose the patterns needed to make efficient use of DMA engines

Code generation

- Specialize code generation to make direct use of DMA engines
  - Specialized, efficient schedules
  - Explicit data movement

First goal: Efficient GEMM

SoftHier DaCe Challenge

Step 1. Micro benchmarks

C = A @ B

NPBench[1]

Step 2. Small scientific applications

ECMWF's CloudSC	**LLNL's LULESH**
– 2.5k lines of Fortran – data parallel – already successfully ported to GPU – SDFG already available	– 2k lines of C – data parallel – uses an unstructured grid – SDFG already available

Step 3. Large weather simulations

ICON
– 1 million lines of Fortran
– one the most important weather and climate simulation codes
–optimizing data movement will have most impact on performance

```
,jk,jb) + &

munications ***
a_v(jc,jk,jb) + &

jb) + &

ENDDO
ENDDO
```

[1]https://github.com/spcl/npbench