Building Tera-Scale Apps with Ct
Productive & Scalable Multi-core Programming

Ct extends C/C++ by adding nested *parallel* data structures and operators

- Support different multi-core hardware through on-the-fly automatic parallelization

- Interface compatible with existing programming environments and APIs

- Simple high-performance parallel code
  - Race-free programming
  - Scalability
  - SSE friendly

C with OpenMP
172 lines of code

Ct
5 lines of code

```
CCtVEC<double>sparseMatrixvectorProduct(
        CCtVEC<double>A,        CCtVEC<int>rowindex,
        CCtVEC<int>cols,
        CCtVEC<double> v)
{
  CCtVEC product = v.ctGather(cols)*A;
  return product.addMultiReduceAdd(rowindex);
}
```
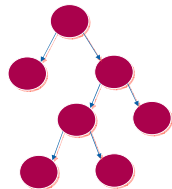
Nested Data Parallelism
Race-Free Irregular Parallel Computation

Multi-core

Tera-scale

Key Ct Applications

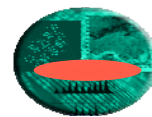Physics simulation   Image processing   Video processing

Emerging Tera-scale Apps

Recognition   Mining   Synthesis

Research at Intel
www.intel.com/research