

# CUDA

## Directions

# C for CUDA



- **First Native C Environment for GPUs**

- 5+ calendar years in development
- Shipping for over 2 years

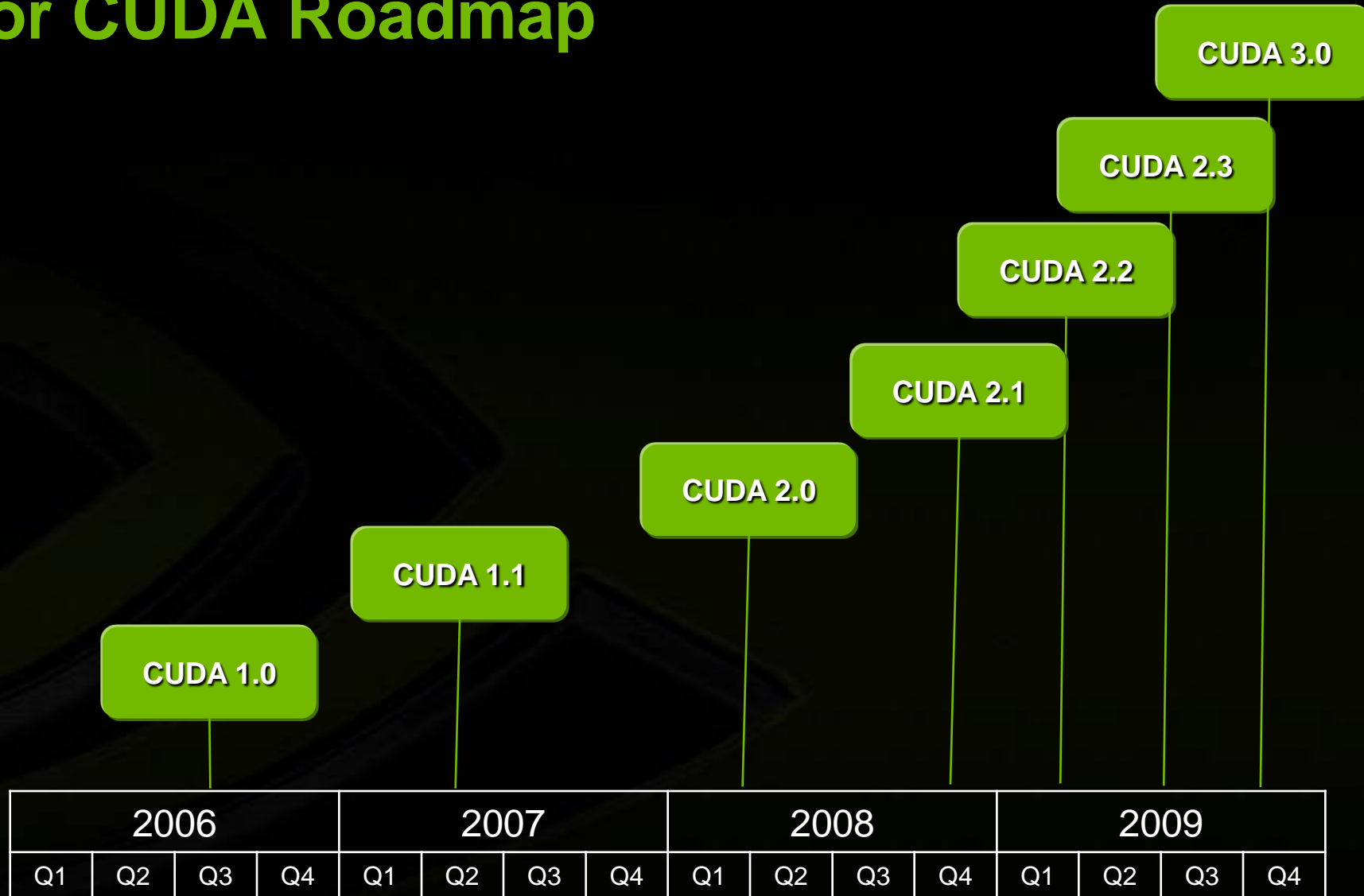
- **Massive Adoption**

- 25,000+ active developers
- 100+ applications
- 30+ NVIDIA GPU clusters using CUDA tool chain

- **Feature Rich**

- Available on Windows, Linux, Mac OS (Solaris coming soon)
- FFT, BLAS, Sparse Matrix, Data Parallel Primitives, LAPACK
- Matlab, Mathematica, LabView supported by C for CUDA

# C for CUDA Roadmap



# CUDA 2.1 (out now!)



- **Support for using a GPU that is not driving a display on Vista**
- **DirectX 10 interoperability (textures, buffers, etc.)**
- **Visual Studio 2008 Support**
- **Just-in-time (JIT) PTX compilation**
  - **For applications that dynamically generate PTX CUDA kernels**
- **CUDA Debugger beta for 32-bit Linux**
- **C++ templates are now supported in CUDA kernels**
  - **This has worked for a while, but now officially supported**
- **Recent Linux distro support**
  - **Including Fedora9, OpenSUSE 11 and Ubuntu 8.04**

# CUDA 2.2 (beta to registered developers now!)



- Zero-copy access to pinned system memory
- Asynchronous memcpy support on Windows Vista
- Texturing from pitch linear memory (i.e. write to texture)
- CUDA Debugger (cudagdb) support for 64-bit Linux
- CUDA OpenGL interop with Texture Objects and FBOs
- Additional counters supported in the CUDA Visual Profiler (cudaprof)
- `__threadfence()` and `__threadfence_block()` (memory fences)

# CUDA 2.3



- **CUDA application profiles**
    - allow end-users to configure GPU availability to applications
  - **CUDA Debugger (cudagdb) support for nested variables**
  - **Query GPU connections to find GPUs not already in use**
    - Useful for cluster management
  - **More...**
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- **Note: subject to change**



# NVIDIA Professor Partnership



[http://www.nvidia.com/page/professor\\_partnership.html](http://www.nvidia.com/page/professor_partnership.html)

- **Support faculty research & teaching efforts**
  - **Small equipment gifts (1-2 GPUs)**
  - **Significant discounts on GPU purchases**
    - Especially Quadro, Tesla equipment
    - Useful for cost matching
  - **Research contracts**
  - **Small cash grants (typically ~\$25K gifts)**
  - **Medium-scale equipment donations (10-30 GPUs)**
- **Informal proposals, reviewed quarterly**
  - **Focus areas: GPU computing, especially with an educational mission or component**

**Easy**

**Competitive**