WHAT IS FLAGON:
- Flagon is a library and a middle-ware framework that allows use of NVIDIA CUDA in FORTRAN.
- Flagon is to ease programming on the GPU from high level languages, including Fortran 9x, C++, and Matlab.
- Flagon is implemented on Intel Fortran on Linux, Windows and MAC OS.

FLAGON FEATURES:
- External CUDA kernel loaders and generic kernel callers allow custom functions to be added and used.
- Pointer like data structures that can be manipulated on the host, used in function arguments etc.
- Minimizes data transfers between host and device.
- Multi-GPU communications.
- Current integrated libraries:
  - CUBLAS/CUFFT
  - CUDDP
  - MPICH2
  - Matrix factorization: LU/QR.

FLAGON FRAMEWORK:
- **FORTRAN Layer**
  - Device Variables (devVar) communicate with lower levels.
  - Fortran interfaces and wrappers pass parameters to C/C++ level.
  - May directly call CUBLAS/CUFFT library functions.
- **MPI Layer**
  - Launches multiple processes via MPICH2.
  - Each MPI process controls one GPU card.
  - GPUs talk to their control processes while messages exchange among the control processes.

FLAGON WORK-CYCLE:
- Compile and link library to user Fortran code.
- Load library into memory.
- Allocate device variables and copy host data to device.
- Work-cycle allows subsequent computations to be performed solely on the device (call CUDA functions, etc).
- Data transfer from device to host when done.
- Discard/free data on the device.

USING FLAGON:
- **Easy to build custom functions**
  1. **Method One**
     - Write the CUDA and C/C++ files to define custom functions.
     - Define the Fortran interfaces for these functions.
     - Copy host data to device.
     - Track (via pointers) allocated device memory.
     - Call custom functions in Fortran code via the defined interface.
  2. **Method Two**
     - Write compatible CUDA functions for Flagon.
     - Compile the [cuFile].cu into [cuFile].cubin.
     - Each MPI process controls one GPU card.
     - GPUs talk to their control processes while messages exchange among the control processes.

**PERFORMANCE SUMMARY**

FLAGON WEBSITE:
http://sourceforge.net/projects/flagon/