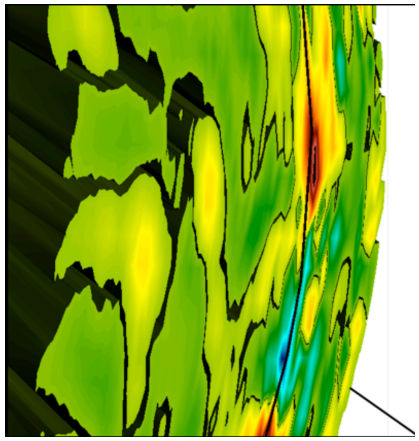
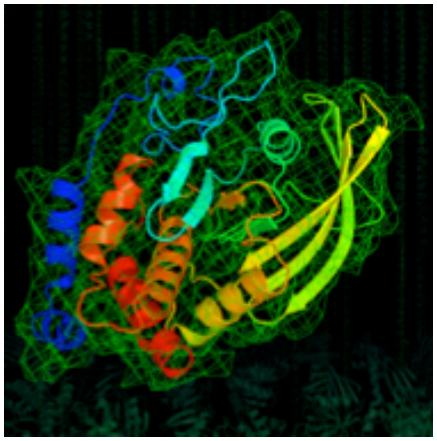
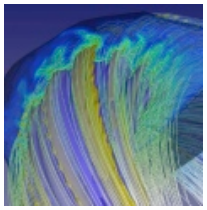
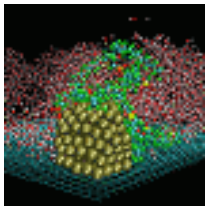
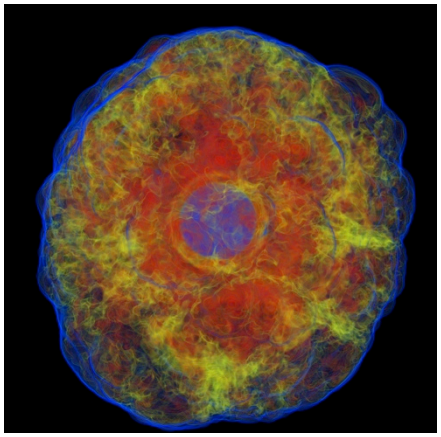
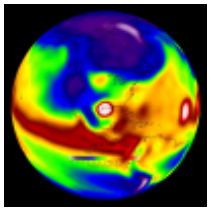
Running Advisor on Cori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How to Compile

- **With Cray compiler wrappers cc/ftn (recommended)**
  - Add -g -dynamic compiler flags

```
cc -g -dynamic -openmp -O2 -o mycode.exe mycode.c
```

- **With Intel native compilers mpiifort/mpiicc**
  - Add -g compiler flag

```
mpiicc -g -openmp -O2 -o mycode.exe mycode.c
```

- **With other compilers**
  - Same basic flags for GNU as for Intel, but different flags for advanced features e.g. SIMD

Setting Up

- **Cache-Aware Roofline Model (CARM)**

```
module load advisor/2018.up1
```

- **Integrated Roofline Model (Cache Simulator)**

```
module load advisor/2018.integrated_roofline
```

How to Run on Cori KNL

- **Start an interactive session on a KNL node**

```
salloc --qos=interactive -C knl -N 1 -t hh:mm:ss -A <your_account>
```

- **To collect data for roofline, do two collections: survey and tripcounts.**

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v
-collect survey -no-auto-finalize -project-dir=<same_dir_name>
-data-limit=0 -- <your_executable>
```

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v
-collect tripcounts -flops-and-masks -project-dir=<same_dir_name>
-data-limit=0 -- <your_executable>
```

- **Run on the Lustre filesystem $SCRATCH**
- **Finalization is very time-consuming on KNL: do it offline**

How to Run on Cori HSW

- **Start an interactive session on a KNL node**

```
salloc --qos=interactive -C haswell -N 1 -t hh:mm:ss -A <your_account>
```

- **To collect data for roofline, do two collections: survey and tripcounts.**

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v
-collect survey -project-dir=<same_dir_name>
-data-limit=0 -- <your_executable>
```

```
srun -n <num-of-ranks> -c <num_of_cores_per_rank> advixe-cl -v
-collect tripcounts -flops-and-masks -project-dir=<same_dir_name>
-data-limit=0 -- <your_executable>
```

- **Run on the Lustre filesystem $SCRATCH**

How to Run Example

- **Start an interactive session on a Haswell node**

```
salloc --qos=interactive -C haswell -N 1 -t 00:30:00
```

- **Run survey and tripcounts of OpenMP application mycode.exe with 32 threads**

```
export OMP_NUM_THREADS=32
export OMP_PLACES=threads                    (=true for GCC compilers)
export OMP_PROC_BIND=spread
```

```
srun -n 1 -c 64 advixe-cl -v -collect survey -project-dir=advisor_data
-data-limit=0  -- mycode.exe
```

```
srun -n 1 -c 64 advixe-cl -v -collect tripcounts -flops-and-masks
-project-dir=advisor_data -data-limit=0 -- mycode.exe
```

How to View Results

- **Launch GUI on login nodes with NX**
  - https://nxcloud01.nersc.gov

```
module load advisor/<version>
advixe-gui
```

- **Install GUI on local machine and view results offline**
  - Incompatible viewers for regular and integrated rooflines

```
/global/common/cori/software/intel/advisor_2018.1.1.534062/mac_os_viewer
/advisor_mac.zip
/global/common/cori/software/intel/advisor_2018.0.2.534031/mac_os_viewer
/integrated_roofline_mac.zip
```

  - Pack results and necessary source/binary files

```
advixe-cl --snapshot --project-dir <same_dir_name> --pack --cache-sources
--cache-binaries -- <target_file_name>
```

  - Scp <target_file_name>.advixeexpz to local machine
  - Open <target_file_name>.advixeexpz with advixe-gui on local machine

Additional Information

- **Add the following flags to reduce runtime for *survey* data collection**
  - -interval=40
  - -stackwalk-mode=online
  - -no-stack-stitching
- **Cray wrappers link statically by default**
  - -dynamic
- **For advisor/2018.up2,** -no-auto-finalize **is incompatible with** -stacks **option**