GEOS OSU Micro-Benchmarking Build on NAS

1. Build OSU Micro-Benchmarks for AMD Milan on NAS Aitken (GCC 12.3.0-TOSS4; Intel MPI 2021.13)

1.1. Navigate to Aitken (SecurePleiadesAitken)

```
# ssh into NAS Secure Front End, where sfeX represents sfe[6-8] and username is your NAS username
ssh username@sfeX.nas.nasa.gov
enter password
enter RSA SecurID Soft Token

# ssh into Pleiades Front End
ssh pfe
enter RSA SecurID Soft Token

# ssh into Aitken Front End
ssh afe01 or afe02
```

1.1.1. Proposed Directory Structure

```
# Pick a new directory in either your nobackup ($NOBACKUP) or home ($HOME) directory

cd $NOBACKUP or $HOME
mkdir -m 0700 benchmarks
mkdir -m 0700 benchmarks/gmao

cd benchmarks/gmao
mkdir -m 0700 cascade/
mkdir -m 0700 cascade/{apps,output,results,src}
mkdir -m 0700 milan
mkdir -m 0700 milan/{apps,output,results,src}
```

Directory Note:

- The "apps" directory will contain the benchmark binaries needed
- The "output" directory will house the raw slurm output
- The "results" directory is where the refined output (csv files) will be stored
- The "src" directory will contain the source files for any benchmarks we compile.

1.1.2. Build OSU Micro-Benchmarks for AMD Milan on NAS Aitken

```
# Allocate an Aitken Milan interactive session for 2 hours to build
qsub -I -W group_list=<group-id> -l select=1:ncpus=20:model=mil_ait, walltime=02:00:00

# Edit bashrc to include GOES-ESM/GEOSgcm modules
vim ~/.bashrc

# Insert (i) into bashrc:
   umask 0022
   ulimit -s unlimited

   # Run things in this if-block only if we're in an interactive shell
   if [[ $- == *i* ]]
   then
      module use -a /nobackup/gmao_SIteam/modulefiles
   fi

# Exit insert (ESC), save and quit Vim (:wq)
source ~/.bashrc

# Purge any previously loaded modules, load the GCC 12.3.0-TOSS4 compiler and Intel MPI 2021.13
module purge
module load comp-gcc/12.3.0-TOSS4
module load mpi-impi/2021.13
module list

umask 0077
cd /your-preferred-directory/benchmarks/gmao/milan/src/
tar xvf osu-micro-benchmarks-7.2.tar.gz
cd osu-micro-benchmarks-7.2/

./configure CC=`which mpicc` CXX=`which mpicxx` --prefix=/your-preferred-directory/benchmarks/gmao/milan/apps/osu-
micro-benchmarks-7.2/comp_gcc_12.3.0_TOSS4-mpi_impi_2021.13
make -j 20
make install

cd ..

rm -vr osu-micro-benchmarks-7.2/
```