

# **HPC Applications on Shaheen**

## **CFD Basic Module**

### ***How to Run Various Test Cases on Shaheen?***

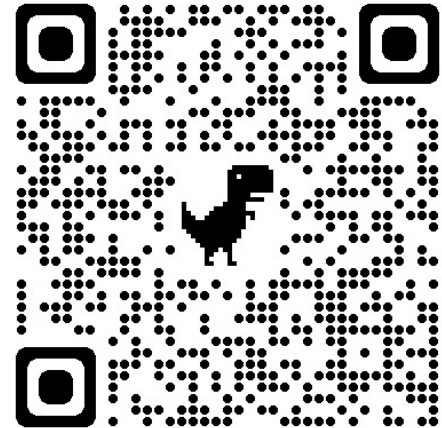
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**KSL Training HPC101**

# CFD Services

- Basic Support: Maintaining and Upgrading Software and Test Cases
- Training: Basic, Intermediate and Advanced
- Helpline - [cfid-helpline@hpc.kaust.edu.sa](mailto:cfid-helpline@hpc.kaust.edu.sa)
- CFD Consulting
- ANSYS Workshop Series
- CFD User Group Meetings
- Student Certification



# Basic CFD Module

- Quick Overview of Applications on Shaheen
- Typical CFD workflow
- CFD Example Cases
  - Ansys/Fluent
  - CONVERGE
  - OpenFOAM
  - Paraview
  - Tecplot
  - Strong Scalability
  - Interactive Computing in Batch Mode
- Shaheen users can find all material here:
  - `/sw/xc40cle7/ansys/cfd_module.tar`

# Applications on Shaheen

## CFD Applications:

- Commercial codes (Fluent, CONVERGE)
- Open source codes (OpenFOAM)
- Code development tools (dealii)
- Mesh generation (ANSYS)
- Post processing (Tecplot, visit, paraview, Ensight)

show all
Analysis
Computational Biology
Computational Fluid Dynamics
Computational Materials Science
Libraries
Molecular dynamics
Program Dev
Quantum Chemistry
Science Apps
Seismic
Software Environment
Tools
Tools Performance

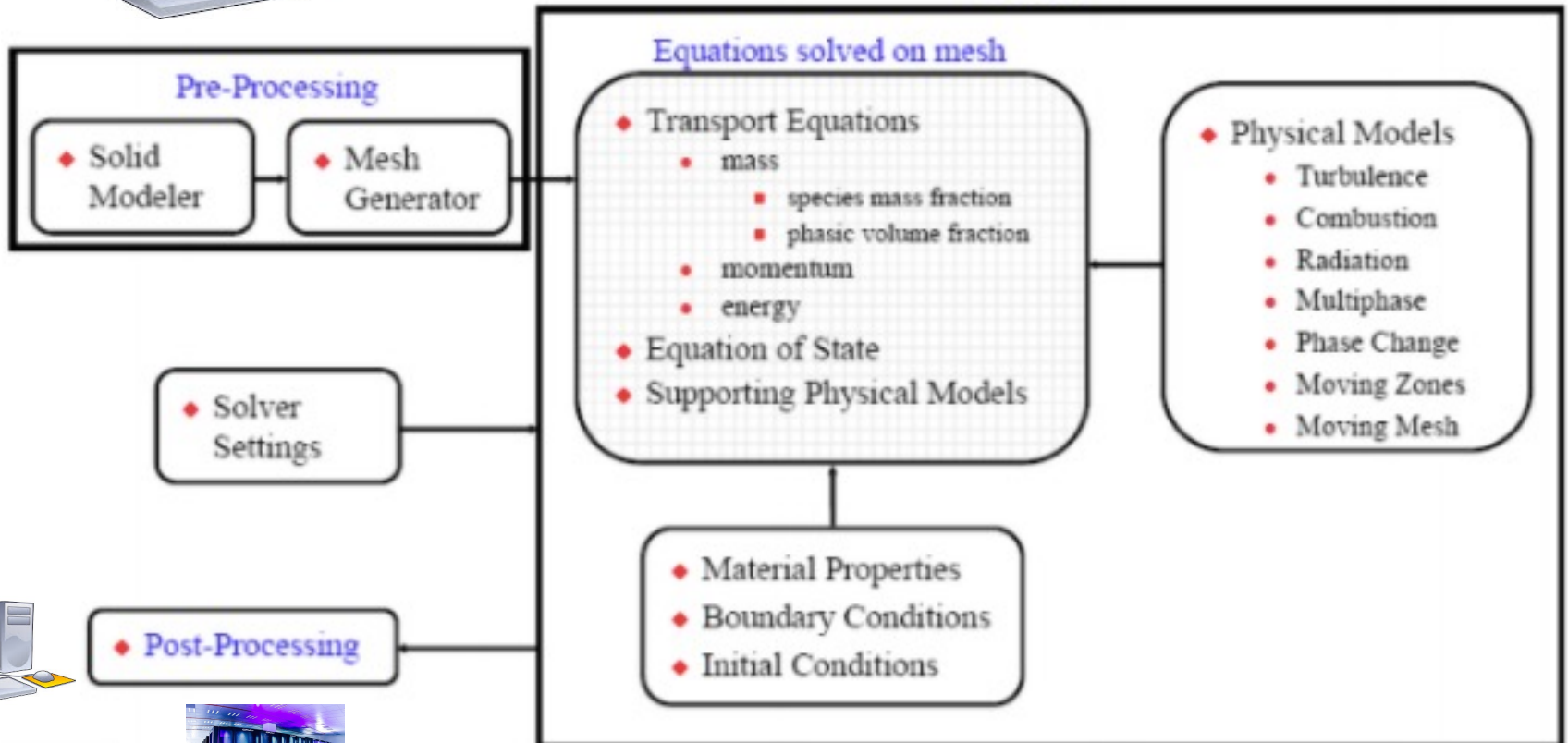
## Applications installed on Shaheen II

sort by name		sort by category	
hpc Analysis	r Analysis	octave Analysis	ffmpeg Analysis
gnuplot Analysis	grade Analysis	grib2 Analysis	net Analysis
ncview Analysis	paraview Analysis	visit Analysis	vcp Computational Biology
blast Computational Biology	internal Computational Biology	ansys Computational Fluid Dynamics	dealii Computational Fluid Dynamics
openfoam Computational Fluid Dynamics	berkeleygw Computational Materials Science	crystal4 Computational Materials Science	dmitw2k Computational Materials Science
atk Computational Materials Science	epresso Computational Materials Science	fleur Computational Materials Science	kwant Computational Materials Science
materialstudio Computational Materials Science	molgw Computational Materials Science	octopus Computational Materials Science	siesta Computational Materials Science
vasp Computational Materials Science	wannier90 Computational Materials Science	wien2k Computational Materials Science	yambo Computational Materials Science
boost Software	gal Software	libint Software	libunwind Software
libxc Molecular dynamics	amber Molecular dynamics	cp2k Molecular dynamics	cpmd Molecular dynamics
gromacs Molecular dynamics	lammps Molecular dynamics	namd Molecular dynamics	plumed Molecular dynamics
grib_api Program Dev	adt Quantum Chemistry	atk Quantum Chemistry	gamess Quantum Chemistry
gaussian09 Quantum Chemistry	molcas Quantum Chemistry	molpro Quantum Chemistry	rwchem Quantum Chemistry
psi4 Quantum Chemistry	qchem Quantum Chemistry	towhee Quantum Chemistry	turbomole Quantum Chemistry
armpoet Science Apps	wpa Science Apps	wrf Science Apps	wrfchem Science Apps
wrda Science Apps	wrplus Science Apps	gnp Software	autotools Software Environment
cmake Software Environment	git Software Environment	ddd Software Environment	valgrind Software Environment
chameleon Software Environment	starpu Software Environment	omps Software Environment	perl Software Environment
python Software Environment	breakit Tools	decimate Tools	kt Tools
extrae Tools Performance	scalasca Tools Performance	tau Tools Performance	

# Typical CFD Workflow



Solver



# Hands-on Demo

- Log into Shaheen
- `cd /scratch/$USER`
- `tar -xf /sw/xc40cle7up03/ansys/cfd_module.tar`
- `cd cfd_module`