

# DAFoam Workshop 2022

v3.0.0

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# Objectives

After this workshop, you should be able to

- Get familiar with the new features and interfaces in DAFoam v3
- Run aerodynamic & aerostructural optimizations with DAFoam v3
- Modify/add DAFoam's C++ and Python codes for a new feature

# A few notes

- We assume you are familiar with DA Foam v2.
- This workshop has **hands-on** examples.
- **Stop** us at any time if you have questions.
- The online meeting will be **recorded**.
- All the materials are available at  
<https://github.com/dafoam/workshops>.

# Outline

1 DAFoam v3

2 DAFoam code development

# DAFoam v3 Introduction

# What is DAFoam ?

## DAFoam : **D**iscrete **A**djoint with Open**FOAM**

DAFoam develops an efficient discrete adjoint method to perform high-fidelity multidisciplinary design optimization. DAFoam has the following features :

- It uses a popular open-source package OpenFOAM ([www.openfoam.com](http://www.openfoam.com)) for multiphysics analysis
- It implements a Jacobian-free discrete adjoint approach with competitive speed, scalability, and accuracy
- It has a convenient Python interface to couple with OpenMDAO ([www.openmdao.org](http://www.openmdao.org)) for multidisciplinary design optimization

# What is new in DA Foam v3 ?

DA Foam v3 is a major release that integrated DA Foam and OpenMDAO for multidisciplinary design optimization (MDO) through the OpenMDAO/Mphys interface

- It developed a new Python interface (`mphys/mphys_dafoam.py`) to Mphys and OpenMDAO for MDO
- Most of the settings are same as v2, but DA Foam v3 uses very different `runScript.py` because it is coupled with OpenMDAO.
- You need to update dependency versions for MDO in v3. Check the DA Foam website (<https://dafoam.github.io>).
- DA Foam v3 is compatible with all v2 run scripts.

## DAFoam code structure



Thank you !