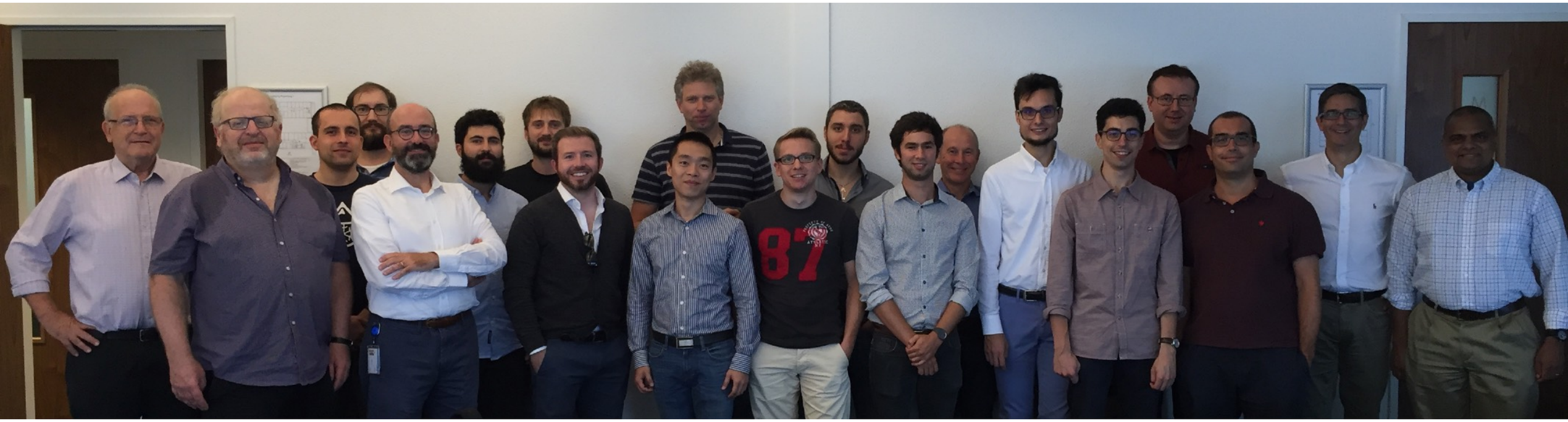
Welcome & Year in Review

Prof. Juan J. Alonso, Dr. Thomas D. Economon, and Dr. Francisco Palacios

3rd Annual SU2 Developers Meeting
University of Strathclyde
Glasgow, Scotland
September 17, 2018

Welcome Developers!



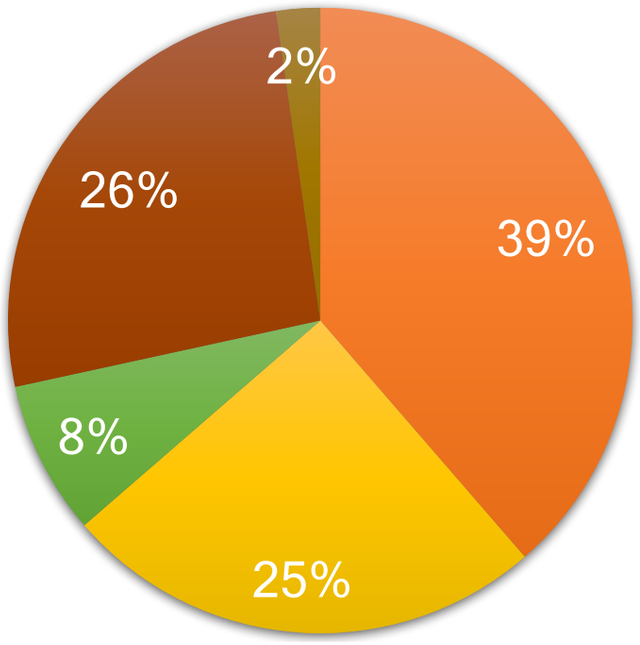
1st Annual SU2 Developers Meeting, September 2016, TU Delft

Welcome Developers!

2nd Annual SU2 Developers Meeting, December 2017, Stanford University

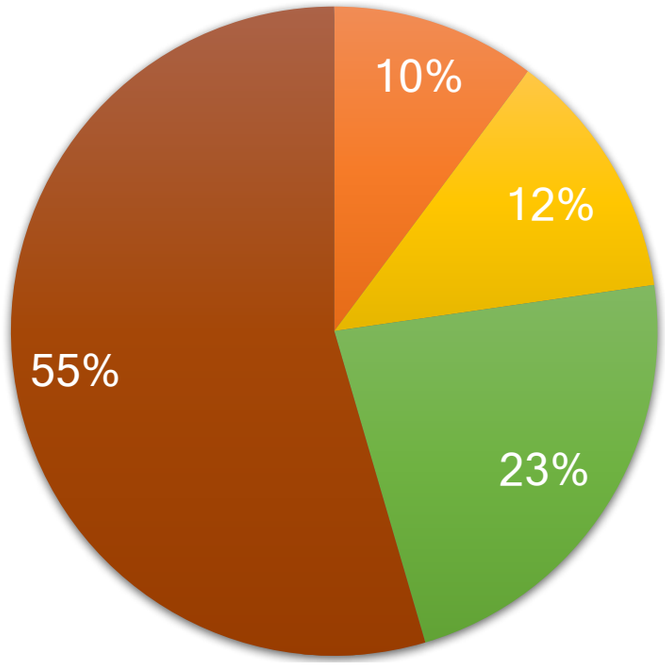
Welcome to the Meeting - Demographics

Affiliation



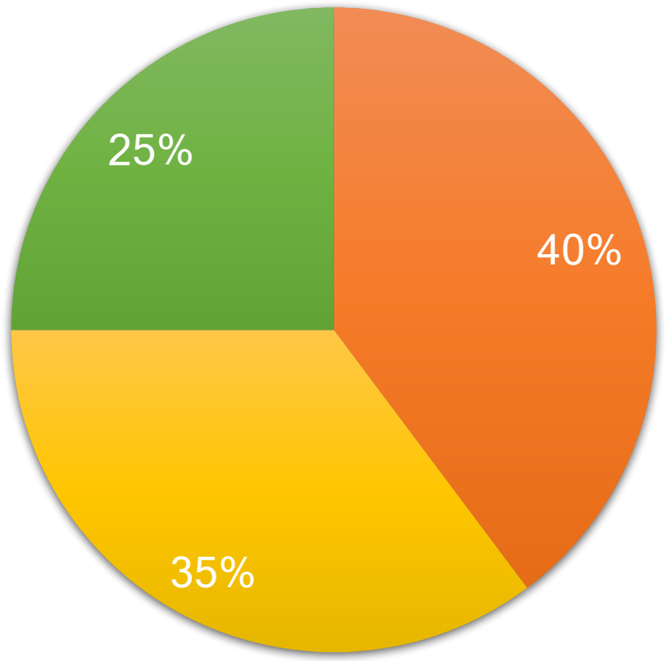
Academia	34	39%
Industry	22	25%
Government	7	8%
Student	23	26%
Other	2	2%

Years of CFD Experience



< 1 Year	9	10%
1-2 Years	11	12%
2-5 Years	20	23%
5+ Years	48	55%

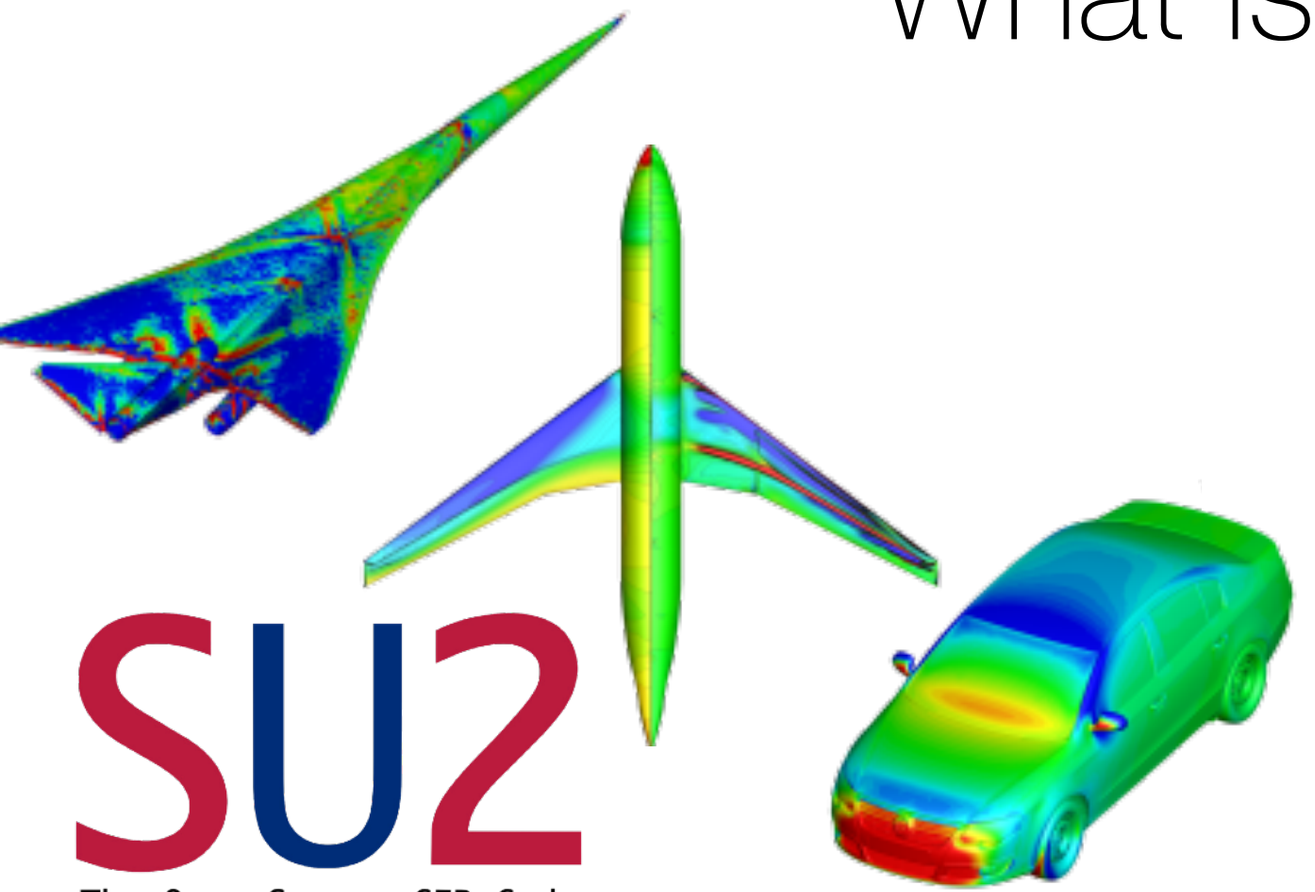
SU2 Familiarity



Developer	35	40%
User	31	35%
Have not used SU2	22	25%

3rd Annual SU2 Developers Meeting Registration Statistics, September 2018, Glasgow, Scotland

What is SU2?



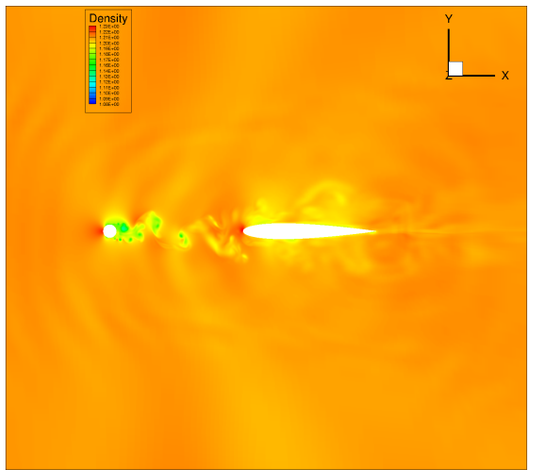
SU2

The Open-Source CFD Code

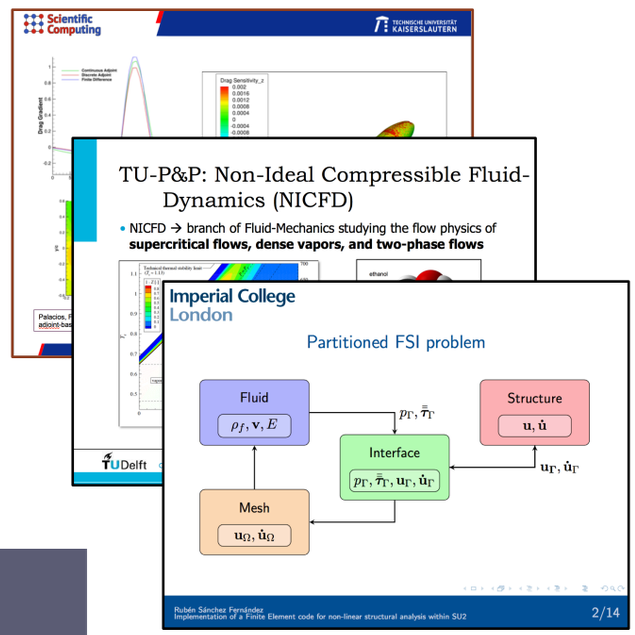
- SU2 is an open-source software package for **multi-physics analysis and design**. Gradient availability through adjoints.
- Research platform for CFD, multi-physics, adjoint methods, HPC, and more. **Reusability**, **readability**, **portability**…
- Software released as **open source** under the LGPL 2.1 license. Available **freely** on GitHub.
- C++/MPI core with a Python layer for automation (~250k lines of code, **HPC-ready**).
- Initial v1.0 release in Jan 2012, v.0 released Feb 2018.

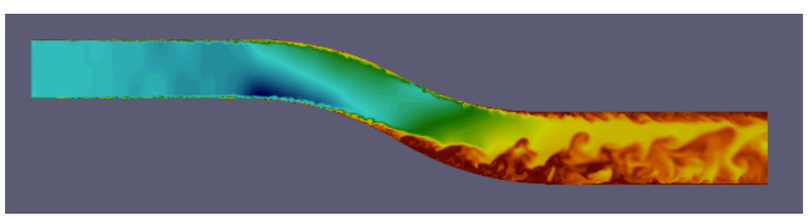
https://github.com/su2code/SU2

https://su2code.github.io



DDES+FWH





DG-FEM Higher-order Solver

SU2 and the NASA CFD Vision 2030 Study

- **Emphasis on physics-based, predictive modeling**

  Transition, turbulence, separation, unsteady/time-accurate, chemically-reacting flows, radiation, heat transfer, acoustics and constitutive models

- **Management of errors and uncertainties**

  Quantification of errors and uncertainties arising from physical models, mesh and discretization, and natural variability

- **Automation in all steps of the analysis process**

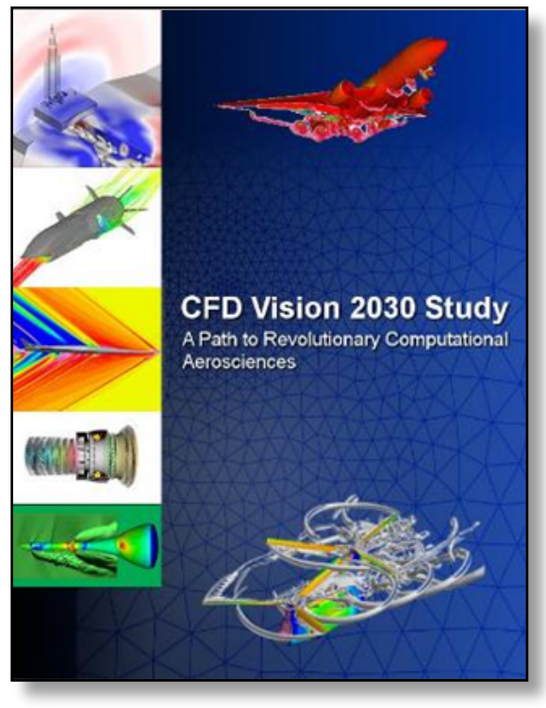
  Geometry creation, meshing, large databases of simulation results, extraction and understanding of the vast amounts of information

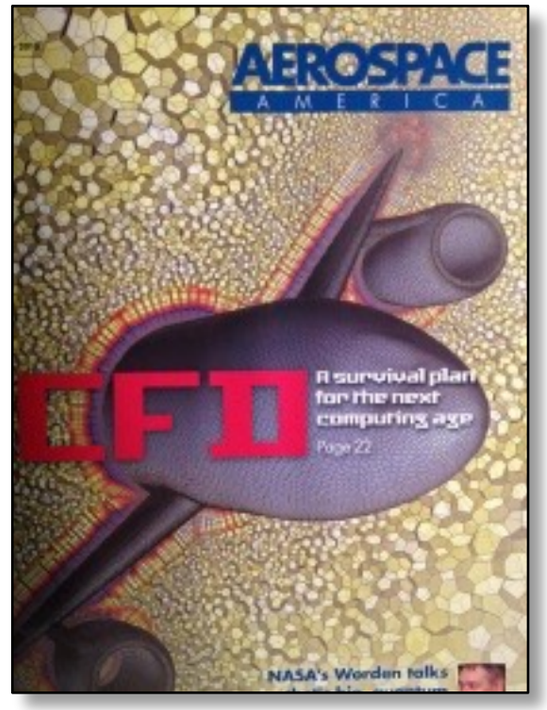
- **Harness exascale HPC architectures**

  Multiple memory hierarchies, latencies, bandwidths, programming paradigms and runtime environments, etc.

- **Seamless integration with multi-disciplinary analyses and optimizations**

  High fidelity CFD tools, interfaces, coupling approaches, the science of integration, etc.





Slotnik, et al., “CFD Vision 2030 Study: A Path to Revolutionary Computational Aerosciences,” NASA/CR-2014-218178, 2014

NASA BOEING

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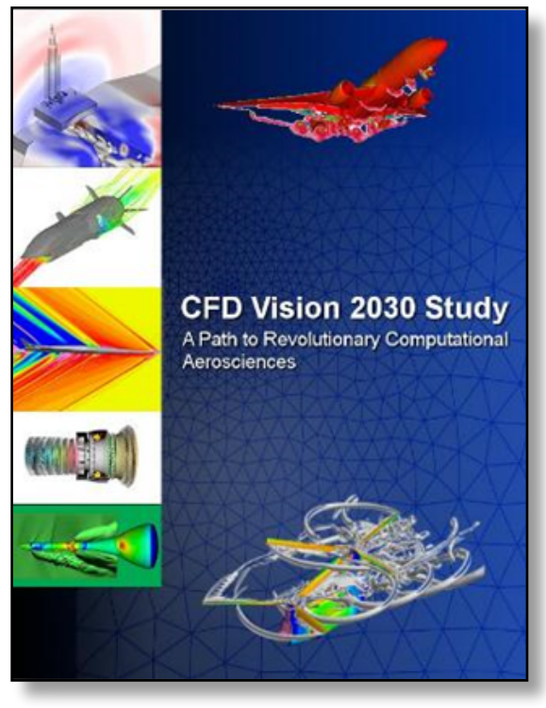
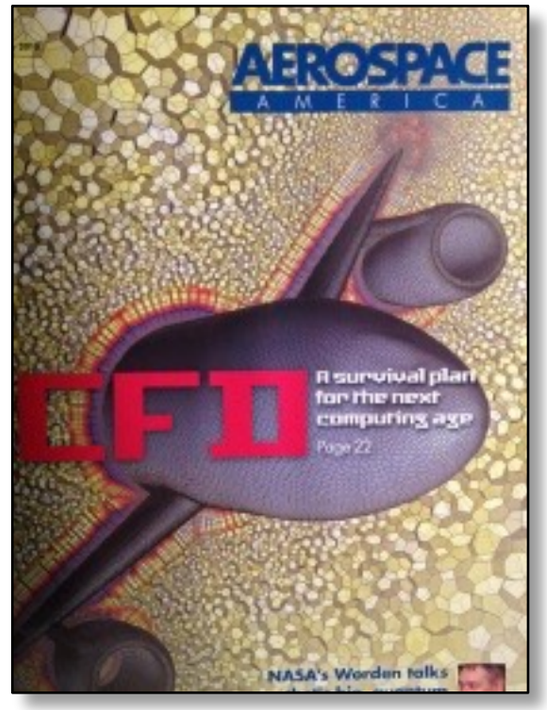




Slotnik, et al., “CFD Vision 2030 Study: A Path to Revolutionary Computational Aerosciences,” NASA/CR-2014-218178, 2014

NASA BOEING

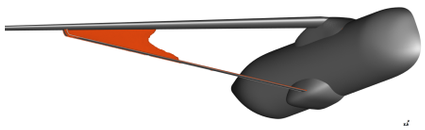
A Global Development Team…

And many others…

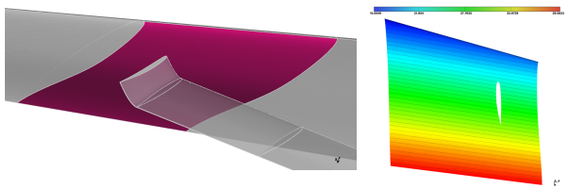
Many Exciting News…

Strut-Braced Wing Design

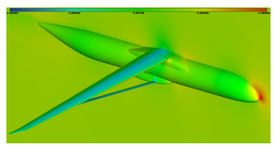
AIRBUS + SU2 The Open-Source CFD Code



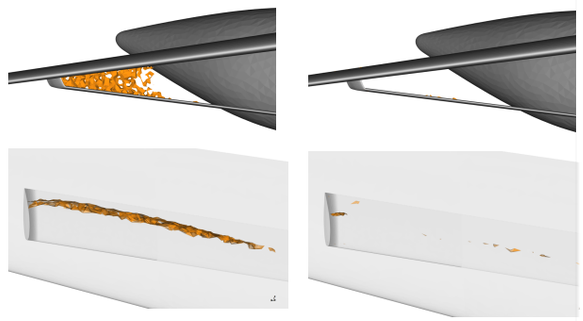
- Strut-Braced Wing aircraft: open model for the community
- Objective: Minimize shock wave drag and separation in strut-wing junction
  - Find candidate flow control technologies and optimization strategies
- Two approaches using SU2:
  - Flow control optimization (transpiration BC)
  - Wing and strut shape optimization



Parametrized transpiration boundary condition used for flow control optimization



RANS flow field



Wave flag : baseline (left) and flow control optimization (right)

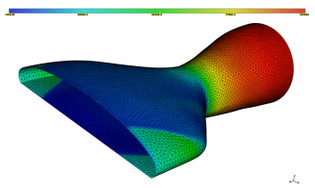
DARPA EQUiPS – UQ and DUU

DARPA + SU2 The Open-Source CFD Code

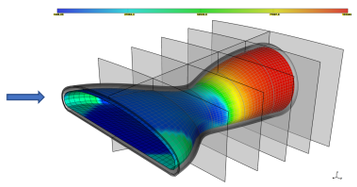
SEQUOIA team: **S**calable **E**nvironment for **Q**uantification of **U**ncertainty and **O**ptimization in **I**ndustrial **A**pplications

- SU2 :
  - Used in high-level UQ methods for robust and reliability-based design.
  - Complex aero-thermal-structural problems with an external structural/thermal solver AERO-S (FRG).
  - Design Under Uncertainty (DUU): robust and reliability-based design

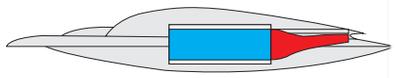
Non-axisymmetric RANS CFD → Thermal FEM → (Non-linear) Structural FEM

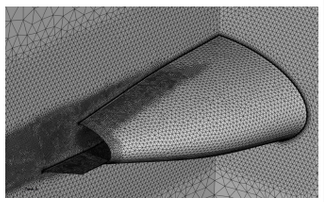


- CFD mesh / pressure



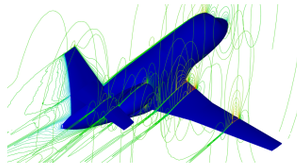
- Interpolated pressure onto the structural / thermal mesh

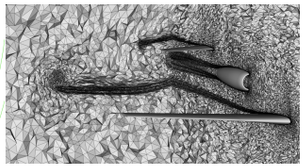




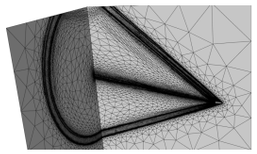
Mesh adaptation with the AMG library

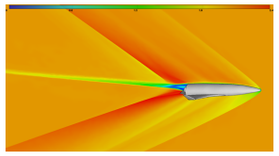
Inria INVENTORS FOR THE DIGITAL WORLD

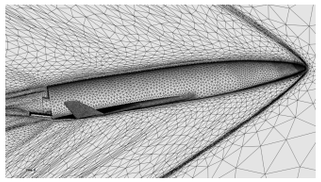


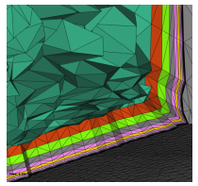


Adapted Dassault Falcon (Euler)

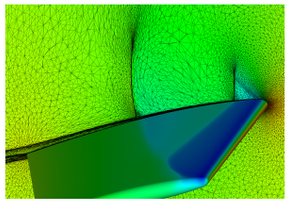




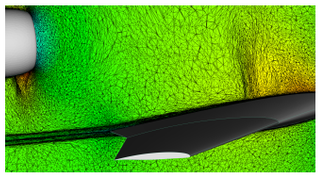




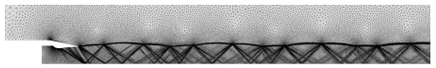
NASA flyer RANS adaptation with frozen boundary layer



Adapted M6 wing (RANS with adapted boundary layer)



Adapted Dassault Falcon (RANS with adapted boundary layer)



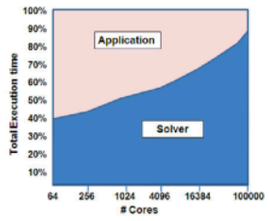
2D axisymmetric nozzle adaptation (DARPA)

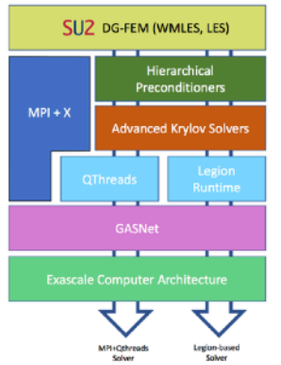
AMG + SU2 The Open-Source CFD Code

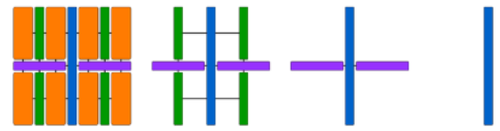
Scalable hierarchical CFD solvers for future exascale architectures

NASA + SU2 The Open-Source CFD Code

- Attempting to resolve scalability bottlenecks in large linear system solutions on modern architectures
- Preconditioners based on low-rank compression and hierarchical matrices
- Pipelined s-step communication hiding and communication reducing strategies for iterative Krylov solvers
- Solver prototypes in Qthreads and Legion/Regent
- Demonstrate in SU2 DG-FEM solver





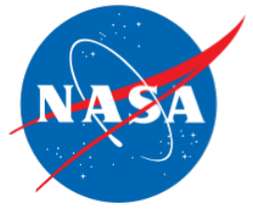


Nested dissection ordering with separators to keep fill-in low

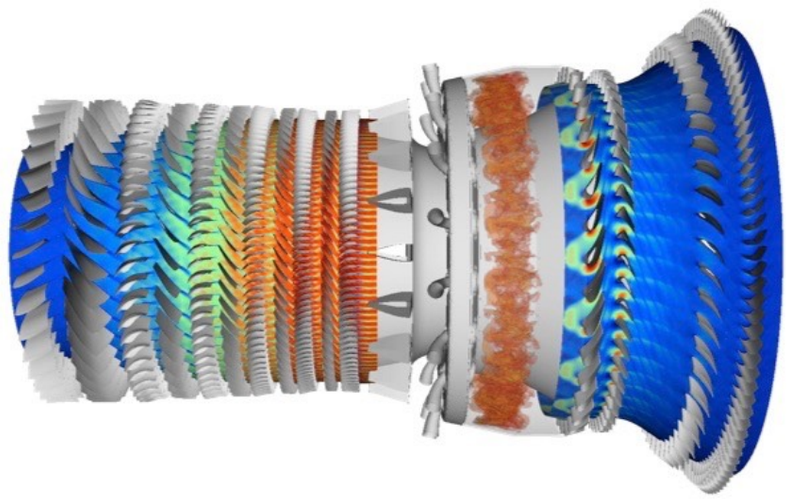
And More News…

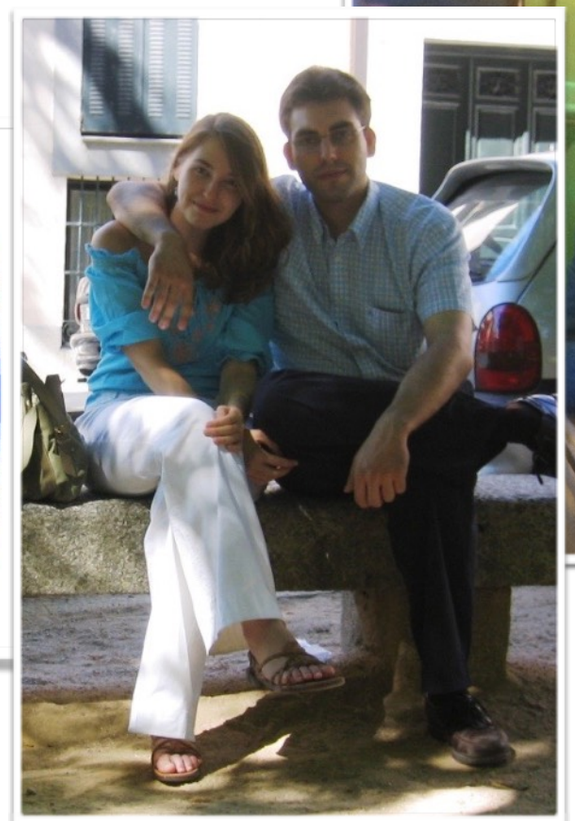
- Continued discussions with members of the industry
- Discussions with LLNL for algebraic multigrid solver / preconditioner
- Discussions with NASA for T-Infinity framework participation
- Conversations with NVIDIA for GPU implementations
- Continued efforts with Pointwise and Tecplot (SZL=Sub-Zone Load on Demand)
- Starting collaboration with Ennova
- Final preparations for SU2 Foundation

ENNOVA TECHNOLOGIES



The SU2 Timeline





SUmb solver developed @ ADL

June 2008
Francisco Palacios completes PhD with Juan Alonso on committee

Summer/Fall 2009
Francisco spends 3 months at Stanford

2010
Work on CADES (predecessor to SU2) begins

Jan 2011
Francisco joins ADL @ Stanford

Summer/Fall
Preparations for releasing SU2 as open source

2003-2008

2009

2010

2011

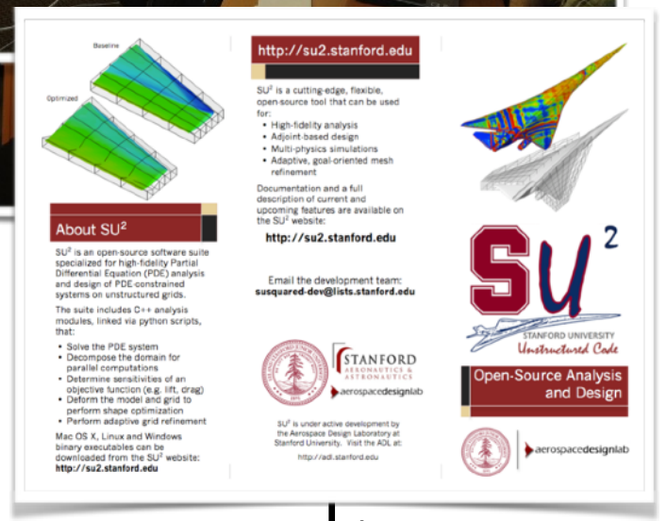
“We must think big... on Jan 20th everybody in the aeronautical community must know that there is a new player in the CFD open-source community.”

- Dr. Francisco Palacios, January 9 2012

Jan 17
Pre-release
Workshop

Oct 31
su2.stanford.edu update

Jan 19
SU2 v1.0
SU2 is born!



Jun 25
SU2 v1.1

Sep 25
First tweet
@su2code

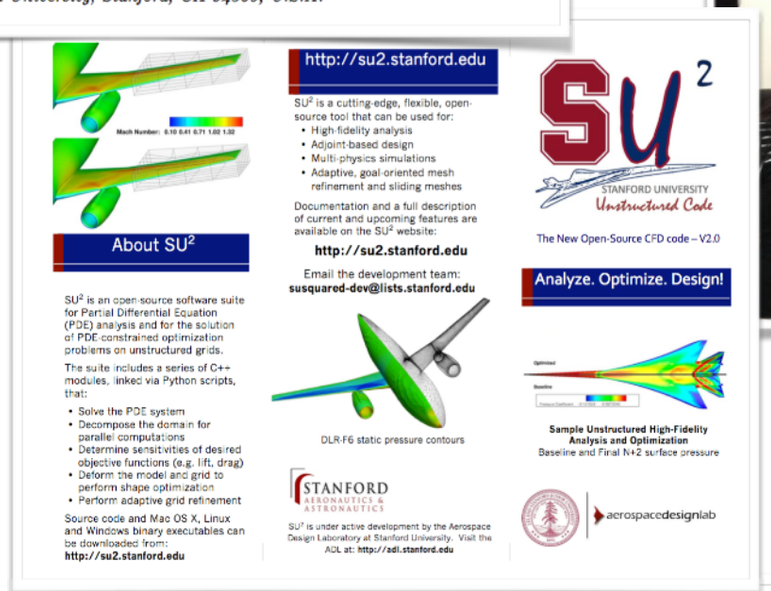
Winter | Spring | Summer | Fall

2012

Stanford University Unstructured (SU²): An open-source integrated computational environment for multi-physics simulation and design.

Francisco Palacios*, Michael R. Colonno*,
Aniket C. Aranake†, Alejandro Campos†, Sean R. Copeland†, Thomas D. Economon†,
Amrita K. Lonkar†, Trent W. Lukaczyk†, Thomas W. R. Taylor†,
and Juan J. Alonso‡
Stanford University, Stanford, CA 94305, U.S.A.

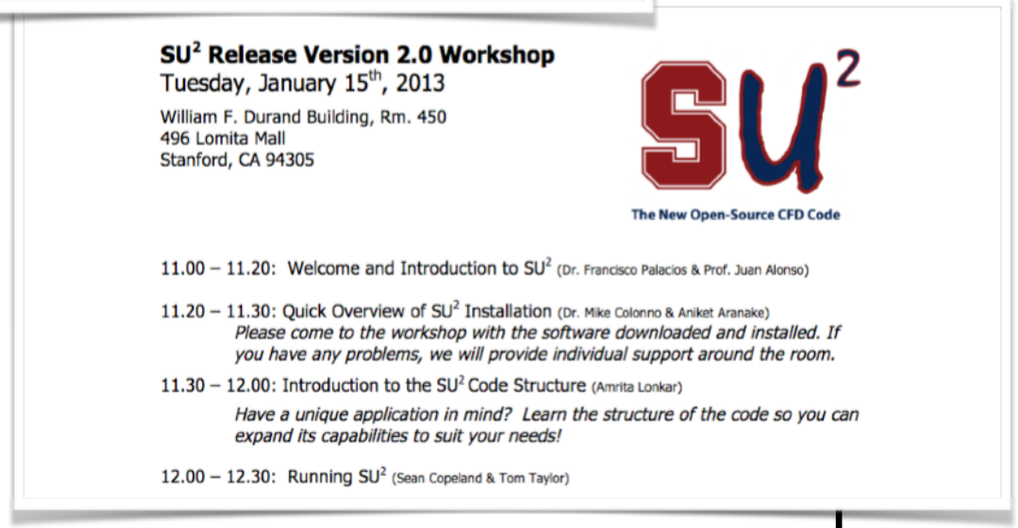
Jan 7
AIAA SciTech
Presentation



May 17 & 25
SU2's first two PhDs

Sep 30
OpenMDAO / SU2
Joint Workshop

Jan 8
SU2 v2.0,
CFD Online
Forum Open

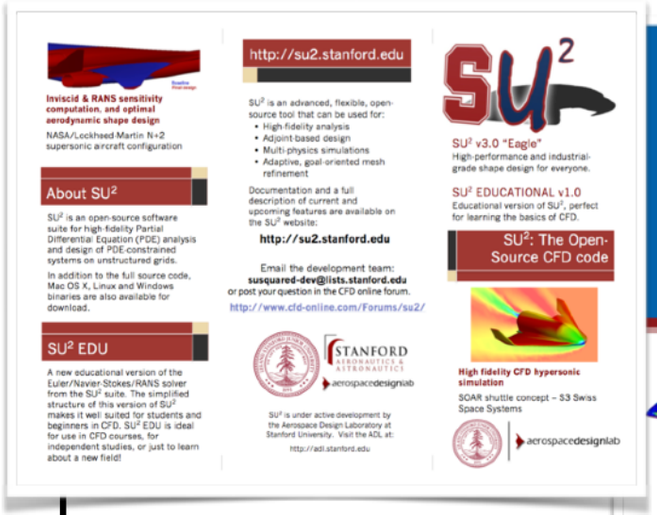


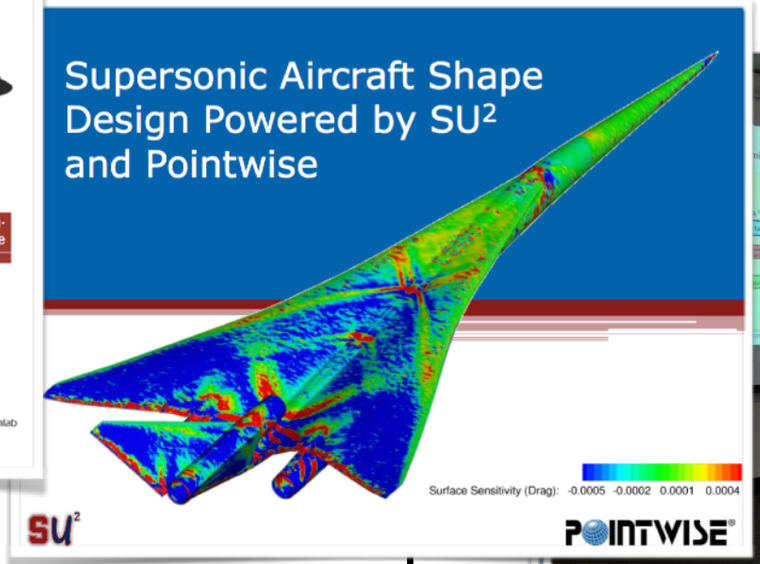
Jan 15
SU2 v2.0
Workshop

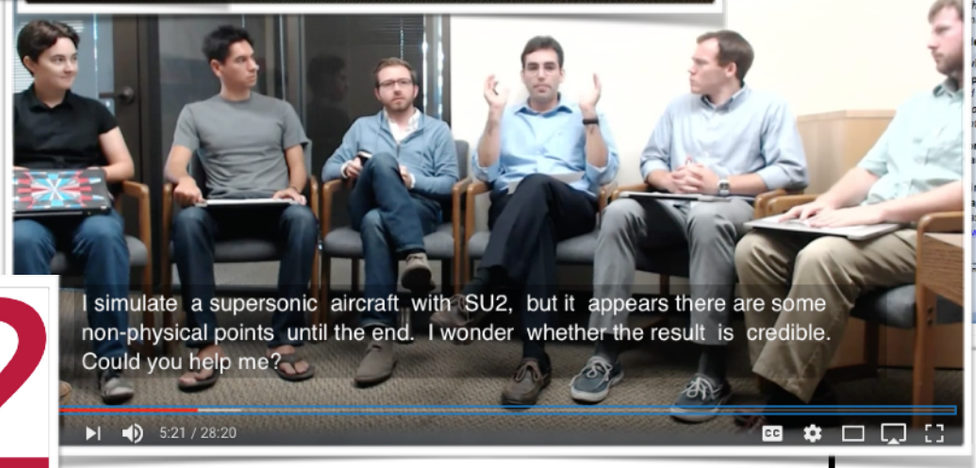
Aug 10
SU2 on GitHub

Winter | Spring | Summer | Fall

2013







SU2
The Open-Source CFD Code

Jan 15
SU2 v3.0
SU2_EDU v1.0

Apr 29
Pointwise-SU2
Webinar

Jul 29 - New Logo

Jul 31
TU Delft & Polimi
Visit Stanford

Sep 29
Pointwise-SU2
Joint Workshop

Apr 14
SU2 v3.1

May 7
Intel Parallel
Comp. Center

Jun 17
SU2 v3.2

Sep 16
Dev
Email List

Sep 24
"This Week in SU2"
Youtube Season 1
Premiere

Winter | Spring | Summer | Fall

2014

Mar 14
Francisco's farewell
from Stanford

SU2: An Open-Source Suite for Multiphysics Simulation and Design

Thomas D. Economon[*]
Stanford University, Stanford, California 94305
Francisco Palacios[†]
The Boeing Company, Long Beach, California 90808
and
Sean R. Copeland,[‡] Trent W. Lukaczyk,[§] and Juan J. Alonso[¶]
Stanford University, Stanford, California 94305

DOI: 10.2514/1.J053813

This paper presents the main objectives and a description of the SU2 suite, including the novel software architecture and open-source software engineering strategy. SU2 is a computational analysis and design package that has been developed to solve multiphysics analysis and optimization tasks using unstructured mesh topologies. Its unique architecture is well suited for extensibility to treat partial-differential-equation-based problems not initially envisioned. The common framework adopted enables the rapid implementation of new physics packages that can be tightly coupled to form a powerful ensemble of analysis tools to address complex problems facing many engineering communities. The framework is demonstrated on a number, solving both the flow and adjoint systems of equations to provide a high-fidelity predictive capability and sensitivity information that can be used for optimal shape design using a gradient-based framework, goal-oriented adaptive mesh refinement, or uncertainty quantification.

Nomenclature

$\frac{\partial F_i}{\partial U}$	=	Jacobian of the convective flux with respect to U	
$\frac{\partial F_{v_i}}{\partial U}$	=	Jacobian of the viscous fluxes with respect to U	
B_i	=	column vector or matrix B, unless capitalized symbol clearly defined otherwise	
(B_x, B_y)	=	in two dimensions, or (B_x, B_y, B_z) in three dimensions	
B^T	=	transpose operation on column vector or matrix B	
$\boldsymbol{b}$	=	spatial vector $\boldsymbol{b} \in \mathbb{R}^n$, where n is the dimension of the physical Cartesian space (in general, two or three)	
C_D	=	coefficient of drag	
C_L	=	coefficient of lift	
C_M	=	pitching-moment coefficient	
C_p	=	coefficient of pressure	
c	=	airfoil chord length	
c_p	=	specific heat at constant pressure	
$\frac{\partial F_{v_i}}{\partial \nabla U}$	=	Jacobian of the viscous fluxes with respect to ∇U	
d	=	nearest wall distance	
$\boldsymbol{f}$	=	force projection vector	
E	=	total energy per unit mass	
F_i	=	numerical convective flux between nodes i and j	
F_{v_i}	=	numerical viscous fluxes between nodes i and j	
F_c	=	convective flux	
F_v	=	viscous fluxes	
$\boldsymbol{f}$	=	force vector on the surface	
$\bar{\bar{I}}$	=	identity matrix	
J	=	cost function defined as an integral over S	
j	=	scalar function defined at each point on S	
k	=	turbulent kinetic energy	
$\mathcal{N}(i)$	=	set of all neighboring nodes of node i	
$\boldsymbol{n}$	=	unit normal vector	
P	=	shear-stress transport turbulent kinetic energy production term	
Pr_d	=	dynamic Prandtl number	
Pr_t	=	turbulent Prandtl number	
p	=	static pressure	
Q	=	vector of source terms	
q_ρ	=	generic density source term	
$q_{\rho E}$	=	generic density source term	
$q_{\rho v}$	=	generic momentum source term	
R	=	gas constant	
$\mathcal{R}(U)$	=	system of governing flow equations	
Re	=	Reynolds number	
$\mathcal{R}_i$	=	system of governing equation residual at node i	
S	=	solid wall flow domain boundary	
$\tilde{S}$	=	Spalart–Allmaras turbulence production term	
T	=	temperature	
t	=	time variable	
U	=	vector of conservative variables	
W	=	vector of characteristic variables	
W_i	=	vector of positive characteristic variables	
W_∞	=	far-field characteristic variables	
Γ	=	flow domain boundary	
Γ_∞	=	far-field domain boundary	
γ	=	ratio of specific heats, equal to 1.4 for air	
ΔS_{ij}	=	interface area between nodes i and j	
$\delta(\cdot)$	=	first variation of a quantity	
$\partial_n(\cdot)$	=	normal gradient operator at a surface point, $\boldsymbol{n}_S \cdot \nabla(\cdot)$	
μ_{dyn}	=	laminar dynamic viscosity	
μ_{tur}	=	turbulent eddy viscosity	
$\mu^{(1)}$	=	total viscosity as a sum of dynamic and turbulent components, $\mu_{dyn} + \mu_{tur}$	
$\mu^{(2)}$	=	effective thermal conductivity; $(\mu_{dyn}/Pr_d)+(\mu_{tur}/Pr_t)$	
$\boldsymbol{v}$	=	flow velocity vector	
ρ	=	fluid density	
τ	=	pseudotime	

ed at Paper 2013-0287 at the 51st AIAA Aerospace Sciences
Including the New Horizons Forum and Aerospace Exposition,
e (Dallas/Ft. Worth Region), TX, 07–10 January 2013; received 1
e 2014; revision received 7 July 2015; accepted for publication 2
ir 2015; published online 28 December 2015. Copyright © 2015 by
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include the code 1533-385X/15 and $10.00 in correspondence with the CCC.
*Postdoctoral Scholar, Department of Aeronautics and Astronautics. Senior Member AIAA.
†Engineer, Advanced Concepts Group. Senior Member AIAA.
‡Ph.D. Candidate, Department of Aeronautics and Astronautics. Student Member AIAA.
§Professor, Department of Aeronautics and Astronautics. Associate Fellow AIAA.

December 29
SU2 in the
AIAA Journal

Wednesday, March 18

MS302
PDE-constrained Optimization using the Open-source Code SU2

2:00 PM - 3:40 PM
Room: 151 AB

Most established codes for PDE-constrained optimization are proprietary, unavailable, or prohibitively expensive for many users. The SU2 code is freely available as open-source and features a complete computational analysis framework for multidisciplinary design in applications such as, but not limited to, aerospace technology. This minisymposium will cover up-to-date topics within the SU2 framework related to its continuous and discrete adjoint capabilities, the application to large-scale aerodynamic design, and the utilization of many-core architectures. Each of the topics covered involve the combination of multiple research areas of interest to the CS&E community.

Mar 18
SIAM CSE
Mini

Jun 23
SU2 v4.0@ AIAA
AVIATION
Travis CI

UNIVERSITY OF TWENTE.

March
TU Kaiserslautern
Visits Stanford

Argonne NATIONAL LABORATORY

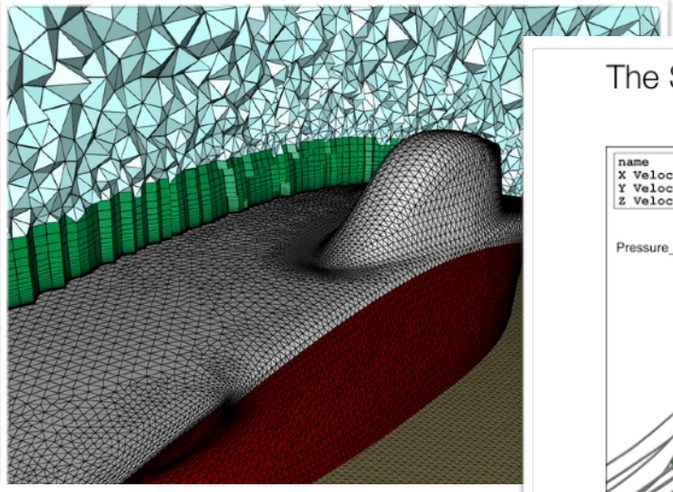
August 6
ALCF Theta
ESP Selection

Imperial College London

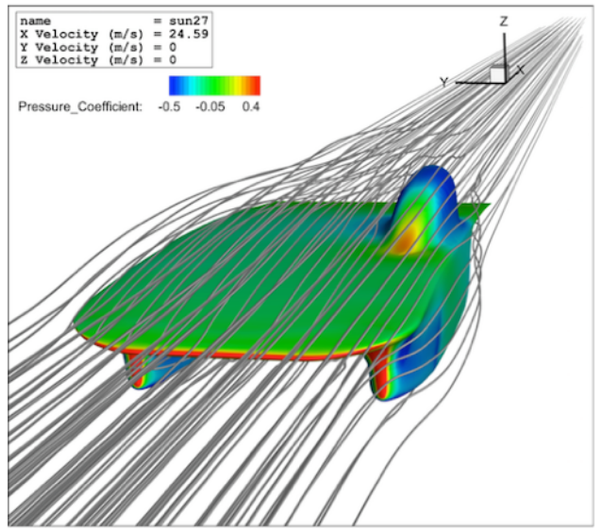
Aug - Sept
Imperial College
Visits Stanford

Winter | Spring | Summer | Fall

2015



The Stanford Solar Car Project's Race for Aerodynamic Efficiency



You are invited to a free webinar on Tue, Apr 5, 2016 8:00 AM - 9:00 AM PDT.

SU2
The Open-Source CFD Code

Continuous ~~or~~ *and* Discrete.

The open-source SU2 package for CFD analysis and design serves not only as a useable example to computational scientists, but also as a common baseline for future development by the entire community. The current open-source model has enabled the leading experts across many technical areas, anywhere in the world, to work together in creating new capabilities that would not have materialized in the absence of collaboration. Today, we demonstrate this once again with the release of SU2 version 4.1 "Cardinal."

Download SU2 v4.1

Through collaboration with the SciComp Team at TU Kaiserslautern, we are proud to introduce the support of Algorithmic Differentiation (AD). Based on
interfaces, this enables exact derivative computations throughout
implementation uses the recently released open-source library, C
derivatives of all occurring operations and to evaluate the final gra
C++ features, like static polymorphism and expression templates,
advanced AD methods (preaccumulation, externally differentiated
communication) result in a low memory footprint and fast evaluati

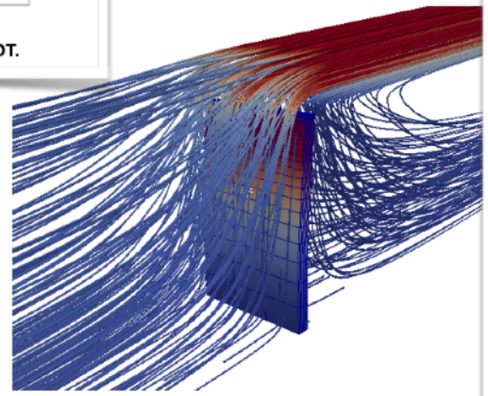
Jan 7
SU2 v4.1

Apr 5
Pointwise,
Tecplot,
SU Solar Car,
SU2 Webinar

Feb 29
NASA LBFD
Announced

SU2
The Open-Source CFD Code

Fluid, meet Structure.



The open-source SU2 package for CFD analysis and design was conceived as a
for multi-physics research. We've been hard at work improving our C++ class arc
more easily support the addition of new physical models and their coupling at a high-level,
and today we are releasing a powerful new example in the form of a fluid-structure
interaction (FSI) capability embedded within SU2 version 4.2 "Cardinal."

Download SU2 v4.2

Jun 15
SU2 v4.2

Jul / Aug
U of Liege
Visits Stanford

1st Annual SU2 Developers Meeting
Sept 5th, 2016
TU Delft, AULA Conference Center, Commissie Kamer 3
Mekelweg 5, 2628 CC Delft, Netherlands

SU2
The Open-Source CFD Code

Meeting Agenda

09.00 – 09.15: Welcome & Introduction

09.15 – 09.35: SU2: Overview of History, Status, and Future Developments
Prof. Juan J. Alonso & Dr. Thomas D. Economon, Stanford University

09.35 – 10.00: NICFD (Non Ideal Compressible Fluid Dynamics) in the SU2 Framework
Prof. Alberto Guardone, Politecnico di Milano (presenter), Profs. Piero Colonna & Matteo Pini, TU Delft

10.00 – 10.25: Automatic Differentiation Discrete Adjoints Using SU2
Prof. Nicolas Gauger, TU Kaiserslautern

10.25 – 10.35: Coffee Break

10.35 – 11.00: Development of a High-Order Discontinuous Galerkin Fluid Solver Within SU2
Prof. Edwin van der Weide, University of Twente

11.00 – 11.25: Fluid-Structure Interaction Problems Using Native and External Structural Solvers Coupled to SU2
Prof. Rafael Palacios (presenter) & Mr. Ruben Sánchez, Imperial College, Prof. Vincent Terrapon & Mr. David Thomas, Université de Liège

11.25 – 11.50: Turbomachinery Simulations Using SU2
Profs. Matteo Pini (presenter) & Piero Colonna, Mr. Salvatore Vitale, Mr. Antonio Rubino, TU Delft Prof. Alberto Guardone, Mr. Giulio Gori Politecnico di Milano

11.50 – 12.15: Mesh Adaptation for SU2 with the INRIA AMG Library
Prof. Juan J. Alonso & Dr. Thomas D. Economon, Stanford University

12.15 – 12.45: SU2 Development Priorities for the Next Year / Discussion
Prof. Juan J. Alonso (moderator), all attendees

In order to participate (in-person or virtually), please register for the meeting by following the link on the SU2 home page (http://su2.stanford.edu).
Thanks for your interest and note that all stated times are Central European Summer Time (CEST).

To find more information about SU2 or to get involved, please visit the following pages:
- SU2 on GitHub: https://github.com/su2code/SU2
- SU2 Forum on CFD Online: http://www.cfd-online.com/Forums/su2/
- Follow SU2 on Twitter: https://twitter.com/su2code

Stanford ENGINEERING Aeronautics & Astronautics · KAISERSLAUTERN · TU Delft · Imperial College London · UNIVERSITY OF TWENTE. · Argonne · TECHNION

Université de Liège

Aug
SU2 v4.3

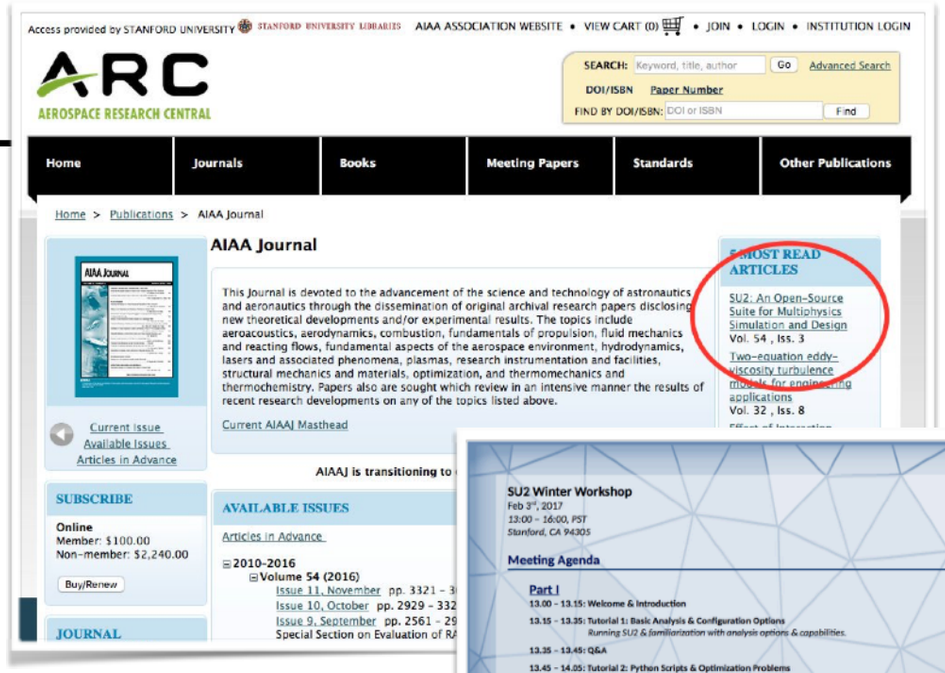
Sep 5
1st Annual SU2
Developers
Meeting

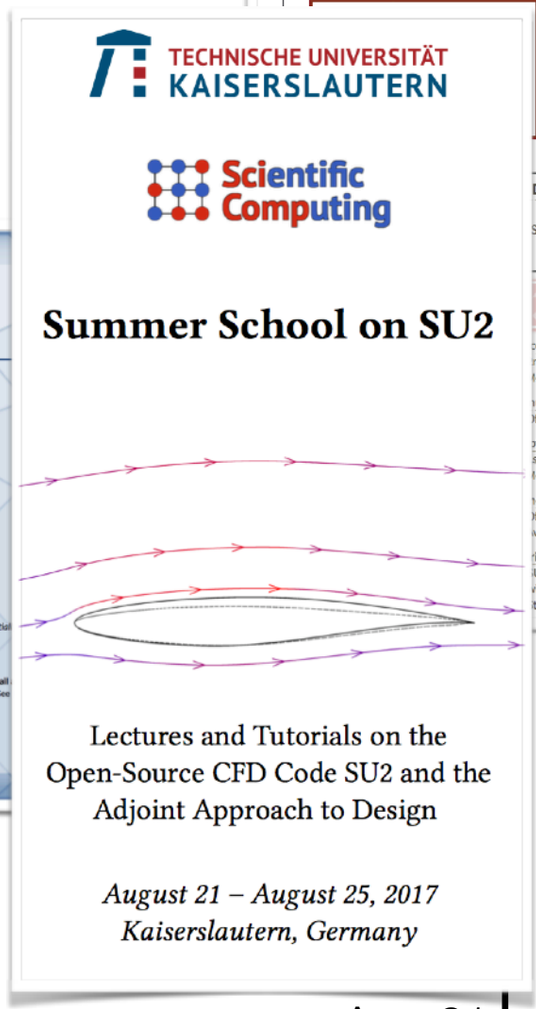
Winter | Spring | Summer | Fall

2016

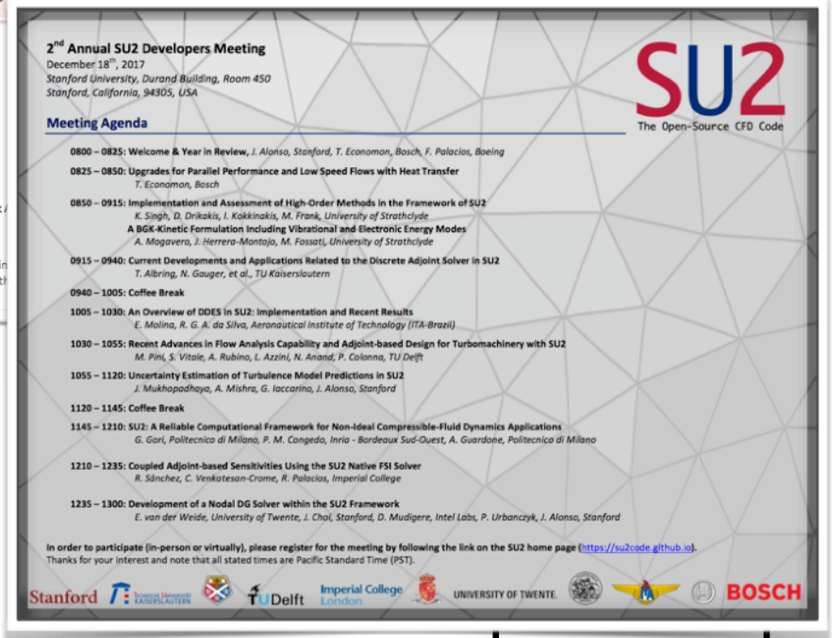
Nov 8 (2016)
SU2 Article Becomes Most Read Paper in AIAA Journal

https://su2code.github.io





Dec1
Open Technical
Call (YouTube)



Jan 19
SU2 v5.0

Feb 3
SU2 Winter
Workshop
@ Stanford

Aug 21
SU2 Summer
School
@ Kaiserslautern

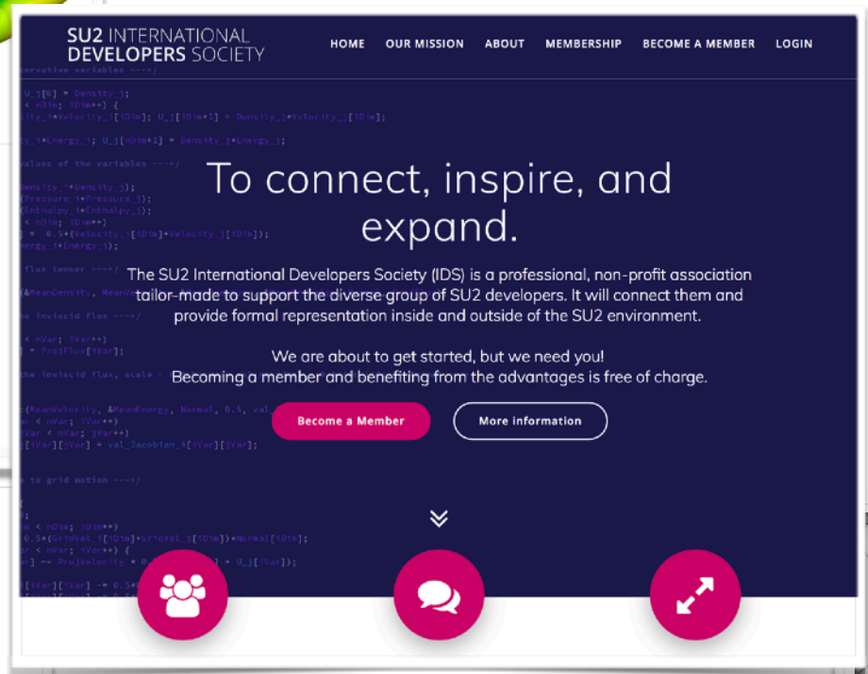
Sep 11
Webpage
Moves
to GitHub

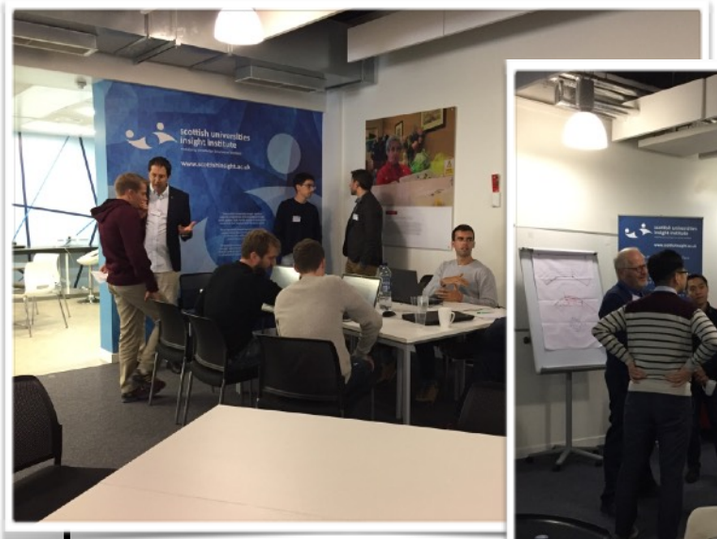
Dec18
2nd Annual
SU2 Dev
Meeting

Winter | Spring | Summer | Fall

2017

https://su2code.github.io (left)
https://www.su2devsociety.org (below)





Sept 16
SU2 Hackathon

SU2
The Open-Source CFD Code

SU2 v6.0 Falcon

Supporting students and professionals since 2012.

Discover SU2 v6.0 Falcon, the latest release of our open-source software for multiphysics simulation and design. SU2 v6.0 Falcon is packed with new features and upgrades, making this the best version of SU2 yet. It's always free, and this version is fierce. If a new release and a new website don't satisfy your appetite for SU2, then you should join the new SU2 International Developers Society, launching today!

Visit the New SU2 Website | Join the Developers Society

Feb 14
SU2 v6.0
New SU2 Website
SU2 IDS is born!

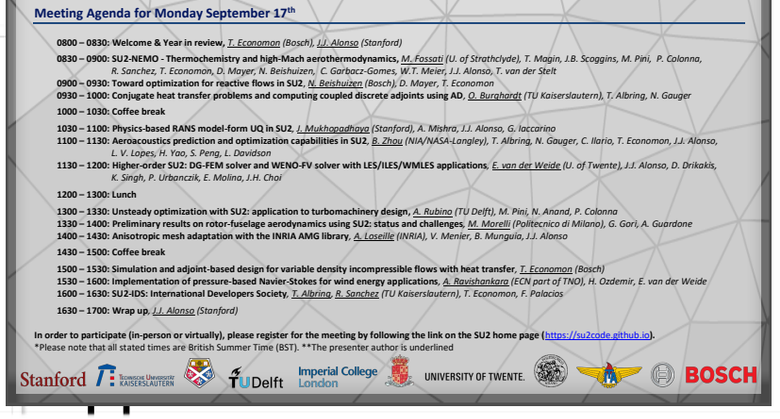
SU2 v6.1 Falcon

Getting better all the time.

Today, we proudly introduce SU2 v6.1. This release contains a new feature set for incompressible flows with heat transfer, and we're pairing it with a new set of tutorials to show you how to use it. Like a fine wine, SU2 just keeps improving with age, and this vintage is available for you to enjoy today.

Download SU2 v6.1

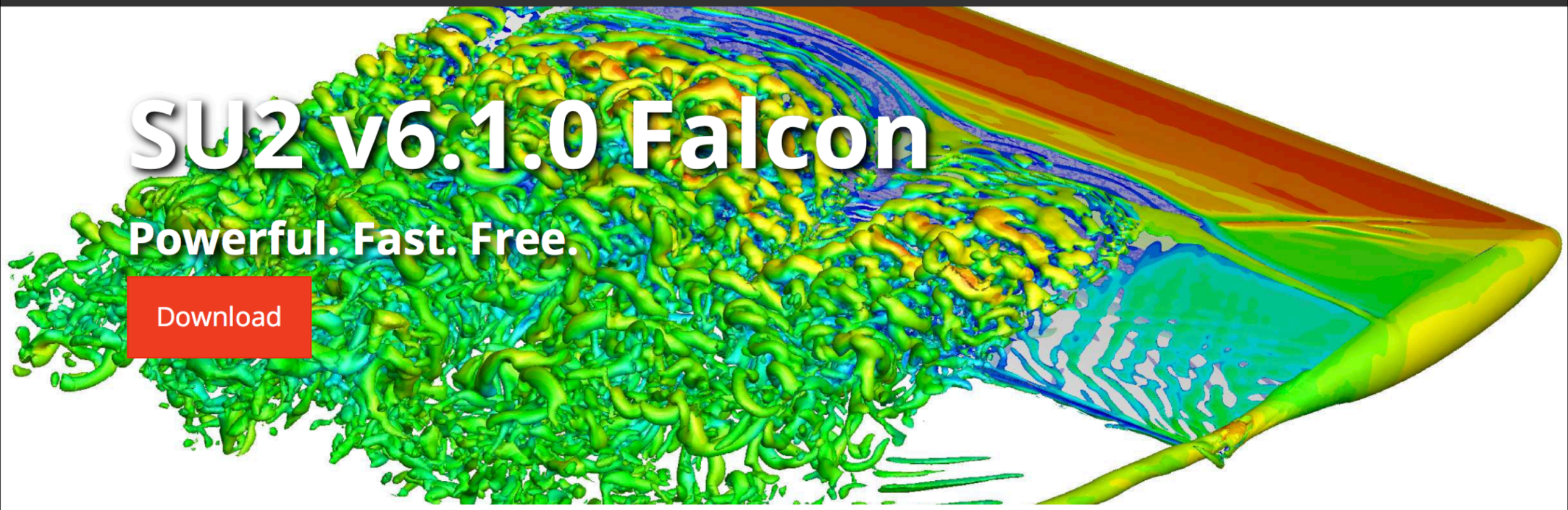
June 22
SU2 v6.1.0


3rd Annual SU2 Developers Meeting
September 16th-18th, 2018
University of Strathclyde, Scottish Universities Insight Institute (SUII)
Glasgow, Scotland, UK
SU2 The Open-Source CFD Code
Meeting Agenda for Sunday September 16th
0900 – 0915: Welcome & Agenda
0915 – 1045: Introduction to developing in SU2: Covering high level class design, how to modify the code, working with GitHub (branching, PRs, regressions), etc.
1045 – 1615: Hack session: Separate groups working on various problems (lunch and snacks/coffee offered in the room while working)
1615 – 1700: Wrap-up Presentations: Two-slide presentations on major progress for the day, including discussion
1730 – open: Social at "The Counting House", 2 St Vincent Place, G1 2DH
Meeting Agenda for Monday September 17th
0800 – 0830: Welcome & Year in review, T. Economon (Bosch), J.J. Alonso (Stanford)
0830 – 0900: SU2-NEMO - Thermochemistry and high-Mach aerothermodynamics, M. Fossati (U. of Strathclyde), T. Magin, J.B. Scoggins, M. Pini, P. Colonna, R. Sanchez, T. Economon, D. Mayer, N. Beishuizen, C. Garbacz-Gomes, W.T. Meier, J.J. Alonso, T. van der Stelt
0900 – 0930: Toward optimization for reactive flows in SU2, N. Beishuizen (Bosch), D. Mayer, T. Economon
0930 – 1000: Conjugate heat transfer problems and computing coupled discrete adjoints using AD, O. Burghardt (TU Kaiserslautern), T. Albring, N. Gauger
1000 – 1030: Coffee break
1030 – 1100: Physics-based RANS model-form UQ in SU2, J. Mukhopadhaya (Stanford), A. Mishra, J.J. Alonso, G. Iaccarino
1100 – 1130: Aeroacoustics prediction and optimization capabilities in SU2, B. Zhou (NIA/NASA-Langley), T. Albring, N. Gauger, C. Ilario, T. Economon, J.J. Alonso, L. V. Lopes, H. Yao, S. Peng, L. Davidson
1130 – 1200: Higher-order SU2: DG-FEM solver and WENO-FV solver with LES/ILES/WMLES applications, E. van der Weide (U. of Twente), J.J. Alonso, D. Drikakis, K. Singh, P. Urbanczik, E. Molina, J.H. Choi
1200 – 1300: Lunch
1300 – 1330: Unsteady optimization with SU2: application to turbomachinery design, A. Rubino (TU Delft), M. Pini, N. Anand, P. Colonna
1330 – 1400: Preliminary results on rotor-fuselage aerodynamics using SU2: status and challenges, M. Morelli (Politecnico di Milano), G. Gori, A. Guardone
1400 – 1430: Anisotropic mesh adaptation with the INRIA AMG library, A. Loseille (INRIA), V. Menier, B. Munguia, J.J. Alonso
1430 – 1500: Coffee break
1500 – 1530: Simulation and adjoint-based design for variable density incompressible flows with heat transfer, T. Economon (Bosch)
1530 – 1600: Implementation of pressure-based Navier-Stokes for wind energy applications, A. Ravishankara (ECN part of TNO), H. Ozdemir, E. van der Weide
1600 – 1630: SU2-IDS: International Developers Society, T. Albring, R. Sanchez (TU Kaiserslautern), T. Economon, F. Palacios
1630 – 1700: Wrap up, J.J. Alonso (Stanford)
In order to participate (in-person or virtually), please register for the meeting by following the link on the SU2 home page (https://su2code.github.io).
*Please note that all stated times are British Summer Time (BST). **The presenter author is underlined
Stanford TU Delft Imperial College London UNIVERSITY OF TWENTE. BOSCH

Sep 17
3rd Annual
SU2 Dev Meeting

Winter | Spring | Summer | Fall

2018



3rd Annual SU2 Developers Meeting

NEW: Download the Meeting Agenda!

Meeting Info Page with Venue and Accommodations

September 16-18, 2018

University of Strathclyde, Glasgow, UK

Register Here!

Major upgrade for https://su2code.github.io

To connect, inspire, and expand.

The SU2 International Developers Society (IDS) is a professional, non-profit association tailor-made to support the diverse group of SU2 developers. It will connect them and provide formal representation inside and outside of the SU2 environment.

We are about to get started, but we need you!
Becoming a member and benefiting from the advantages is free of charge.

Become a Member **More information**

New web portal: https://www.su2devsociety.org

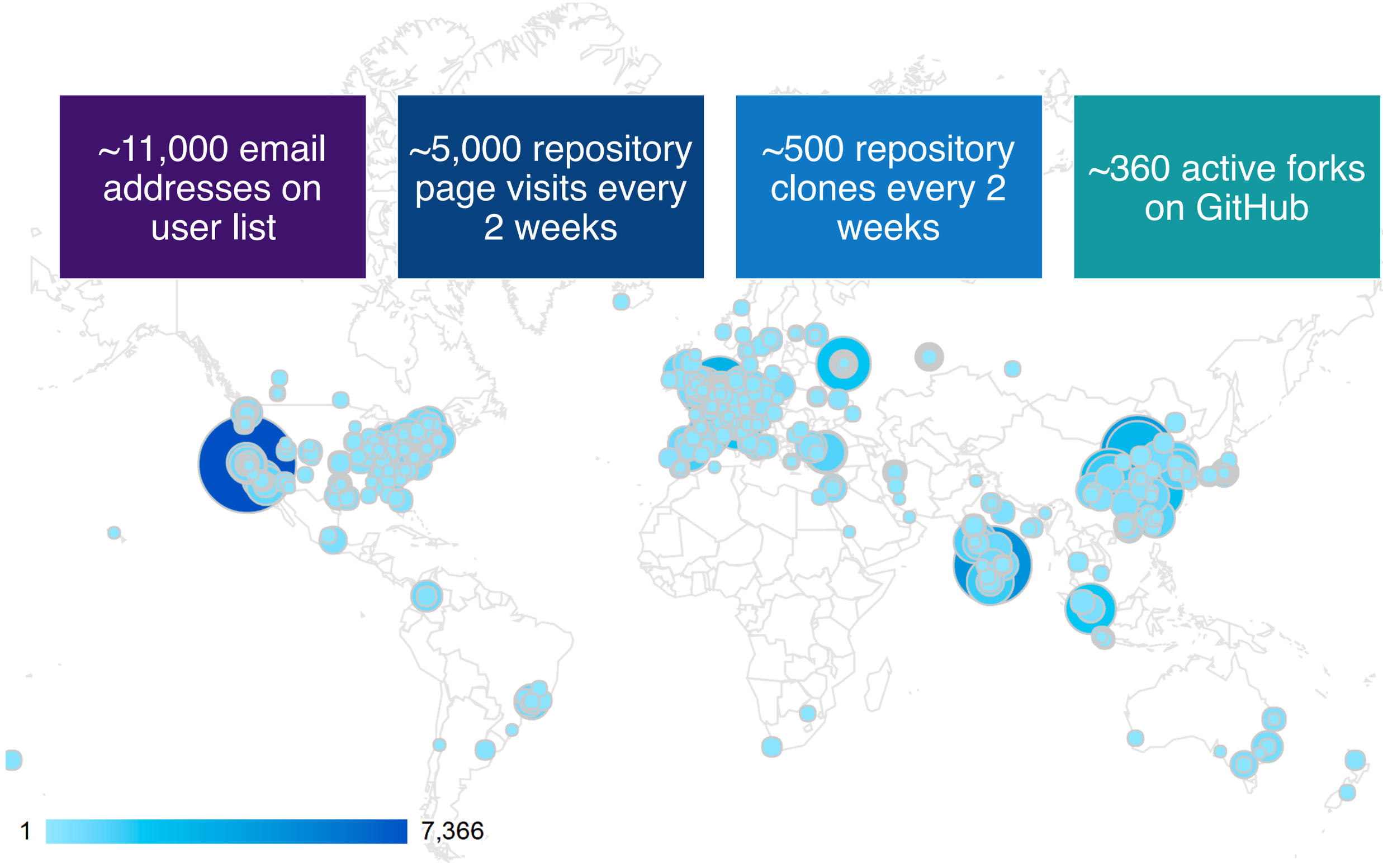
Where are we today? Everywhere.

~11,000 email addresses on user list

~5,000 repository page visits every 2 weeks

~500 repository clones every 2 weeks

~360 active forks on GitHub



Map shows web hits at https://su2code.github.io by city.

51 Pull Requests in 2018

455 Commits to ‘develop’ Branch in 2018

228k Lines of C/C++ Code as of v6.1.0

209 Continuous Regression Tests

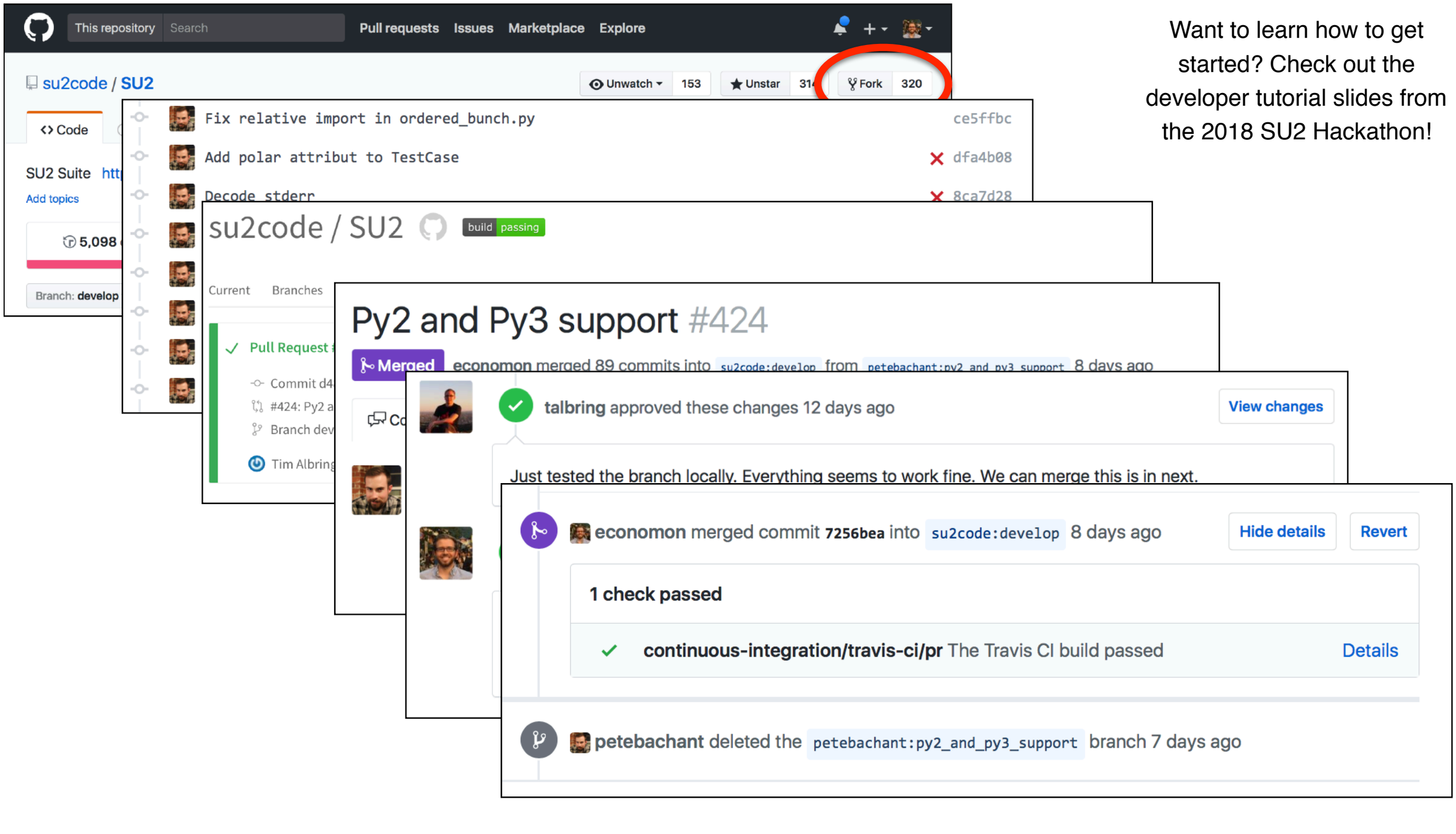
154 Active Branches in Repository

362 Active Forks on GitHub

As of 09.16.2018, includes lines of code in externals/*

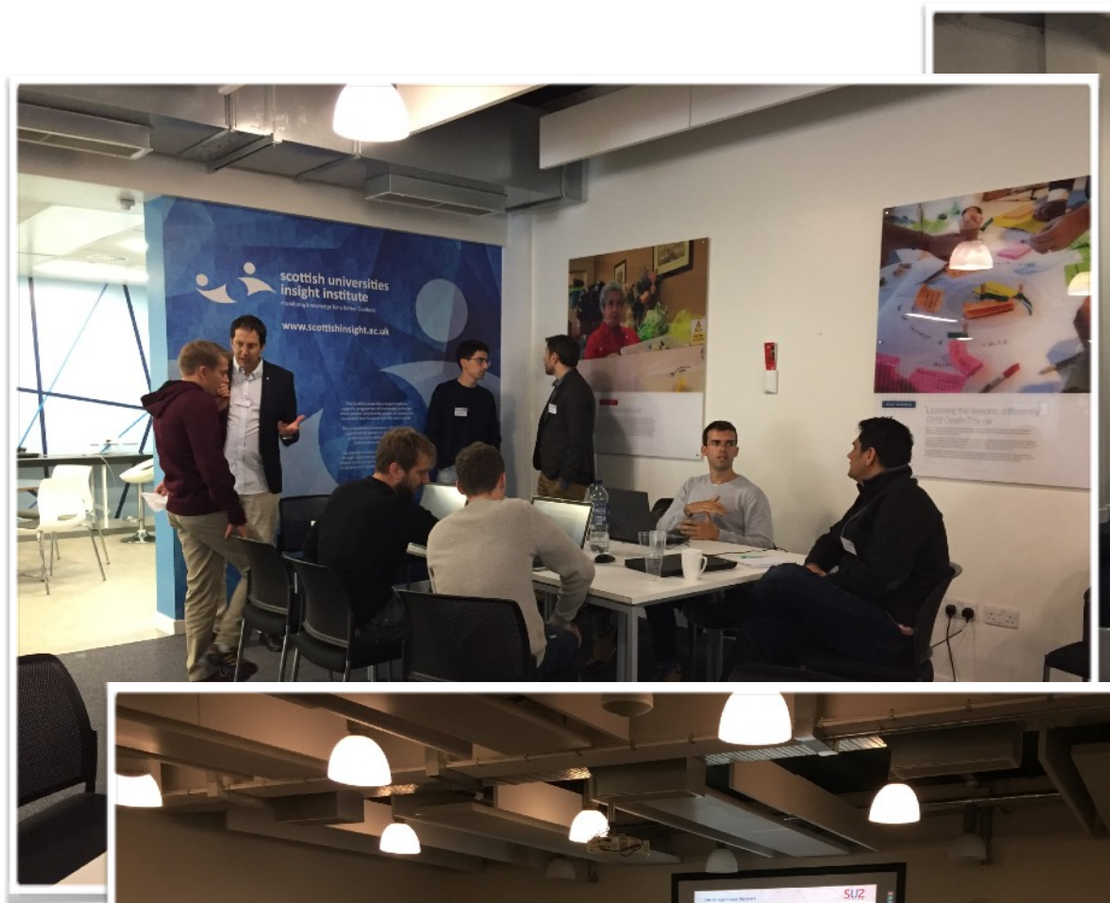
Anyone can be an SU2 Developer.

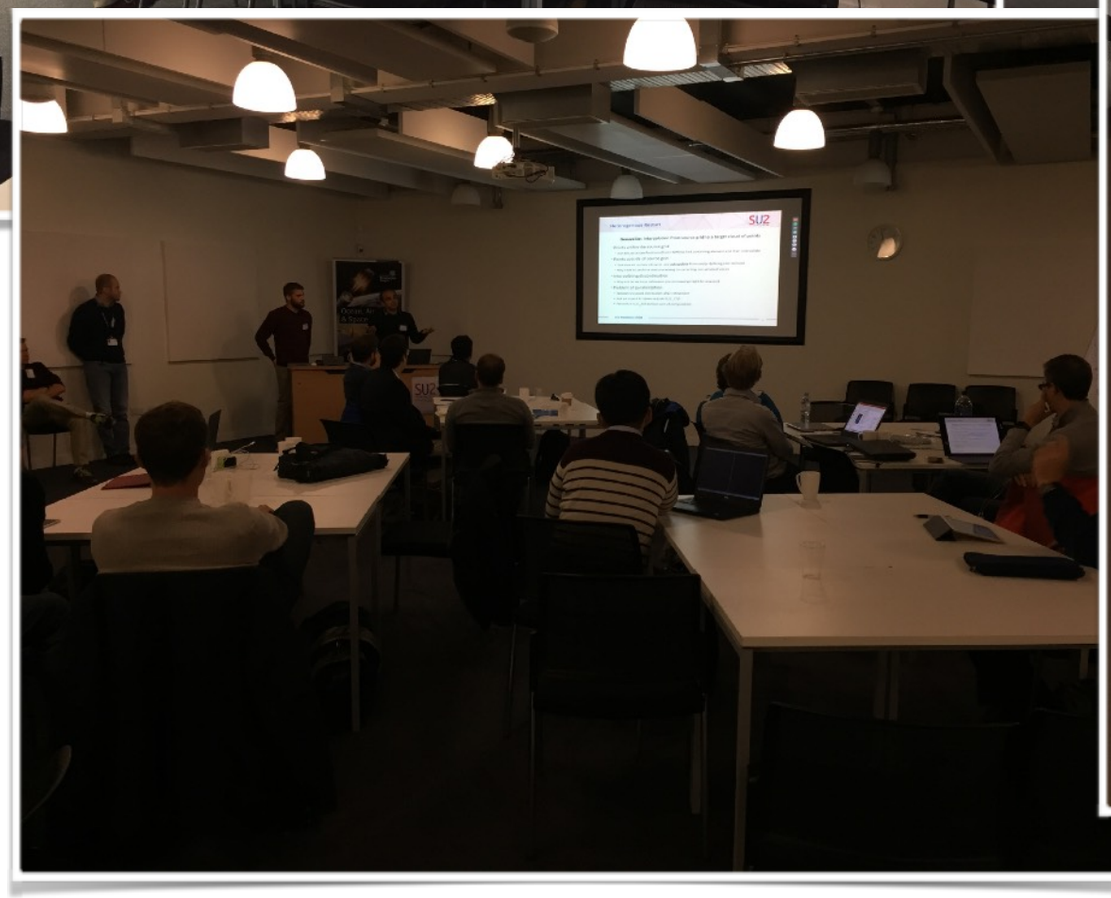
Git/Branching — Development — Regressions — Pull Request — Release

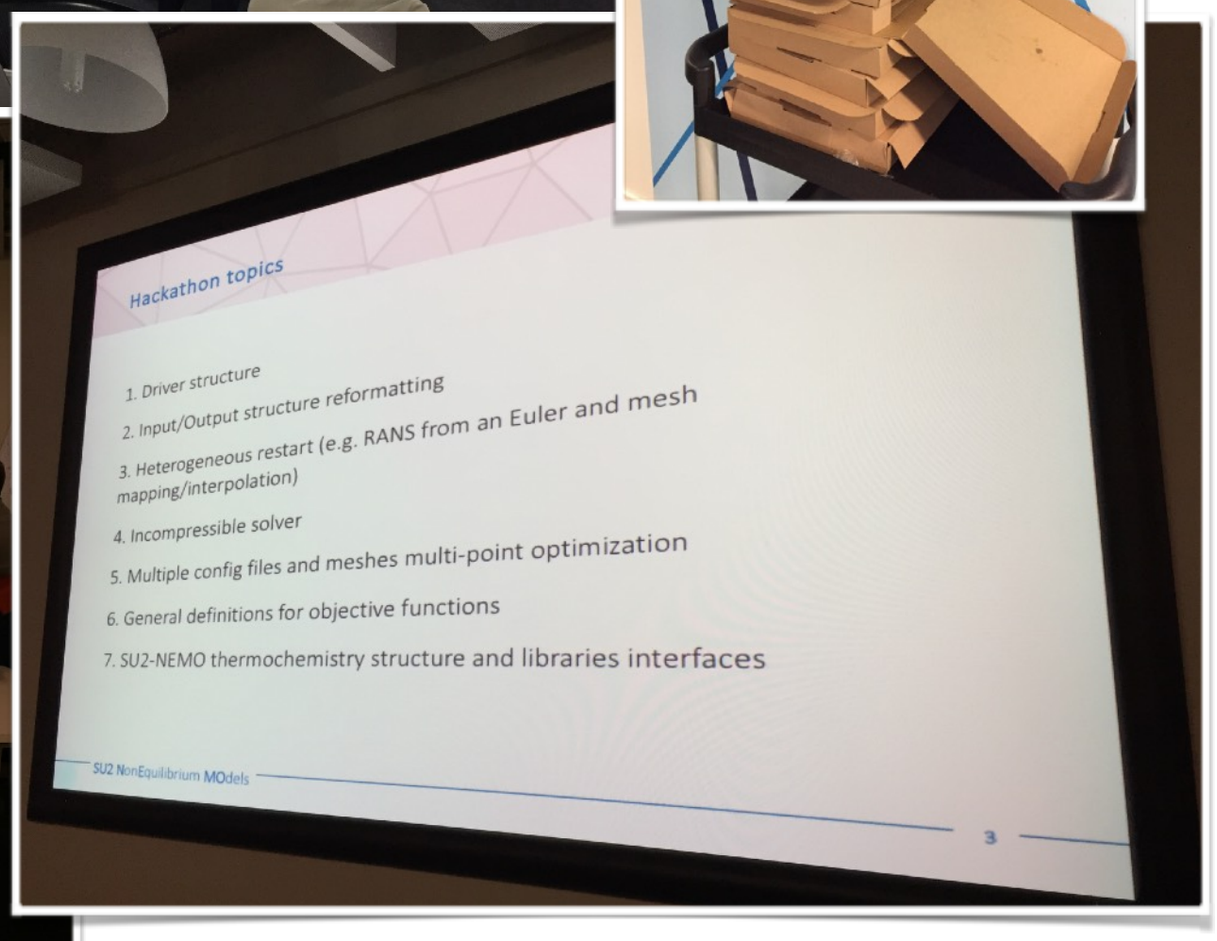


Want to learn how to get started? Check out the developer tutorial slides from the 2018 SU2 Hackathon!

Hackers Welcome Here.

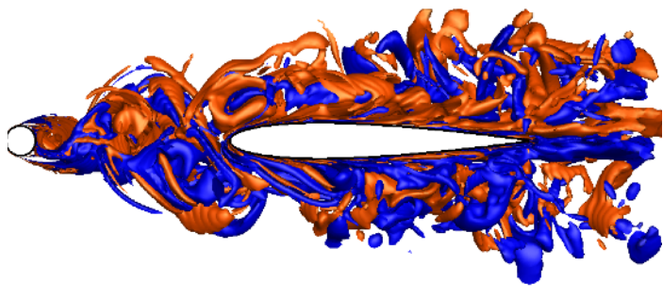




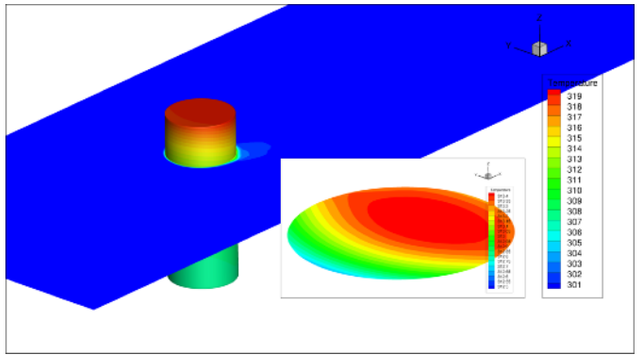


Pictures from our official SU2 Hackathon on Sunday September 16, 2018.

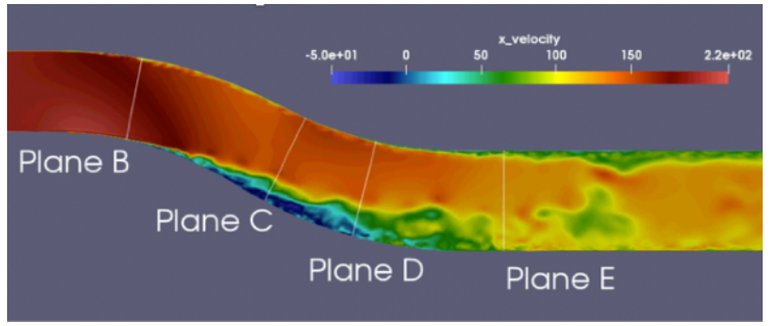
Some Topics for Today



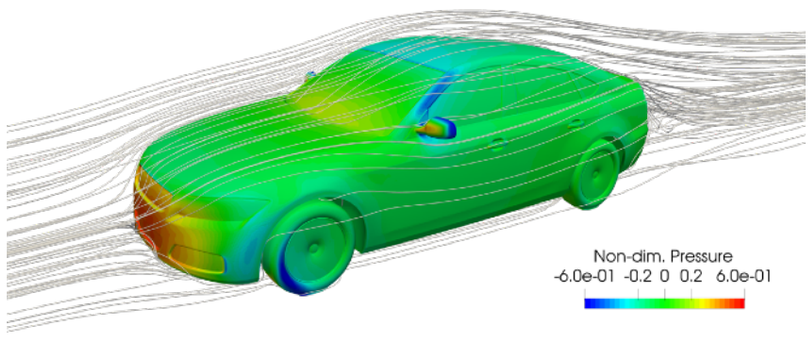
DDES + FWH



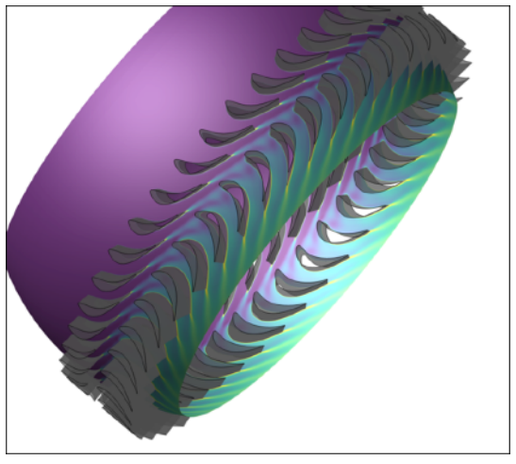
Coupled-Adjoints for CHT



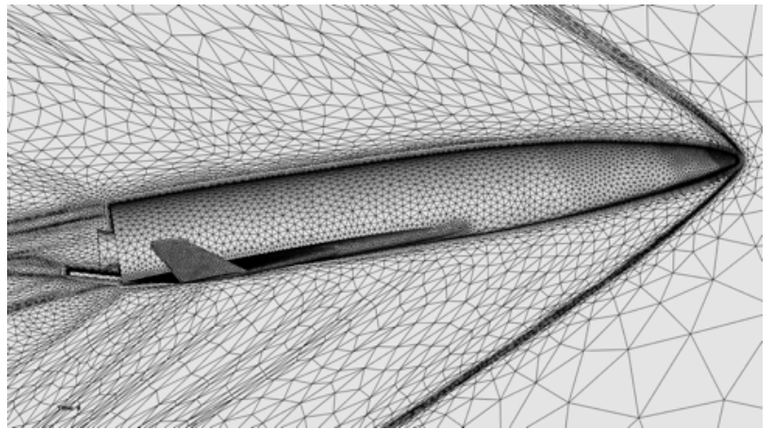
High-Order DG-FEM Solver for iLES/LES/DNS



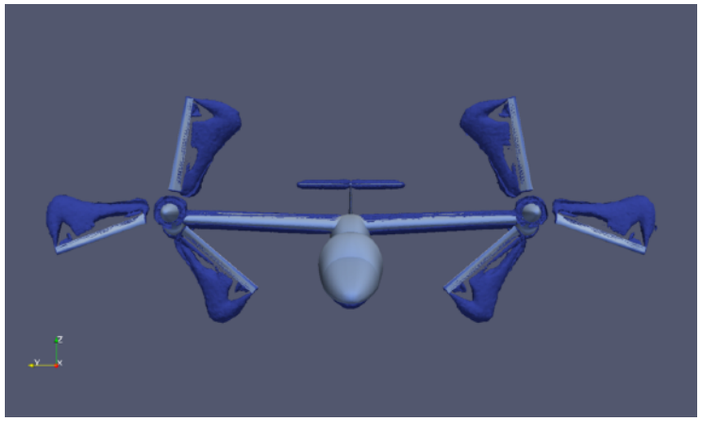
Incompressible Flows



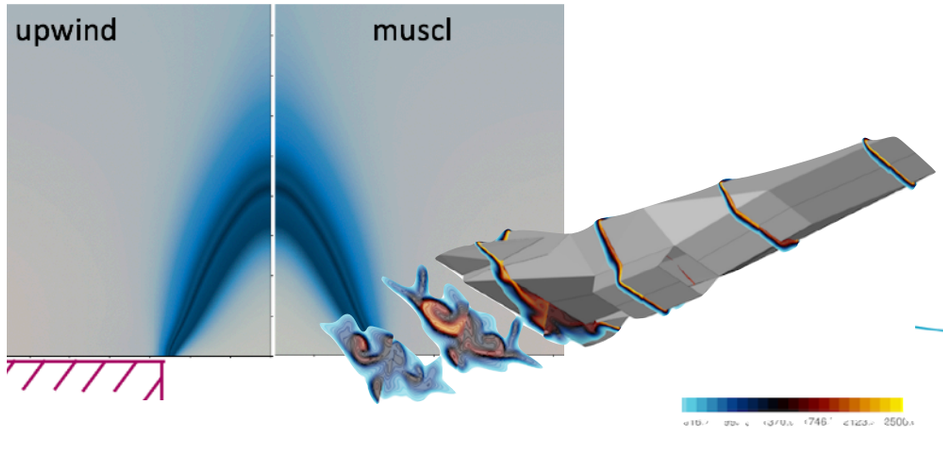
Unsteady Turbomachinery Design



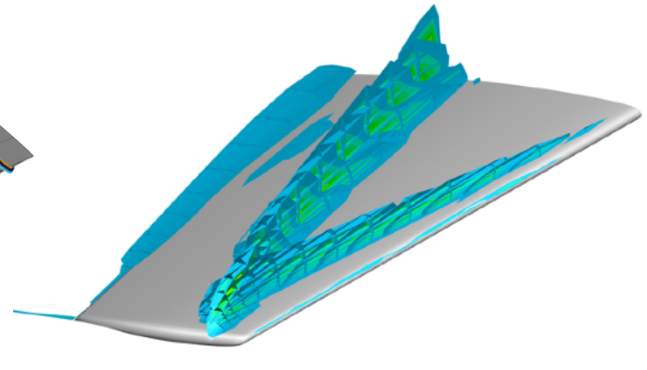
Mesh Adaptation



Rotor-Fuselage Aerodynamics



Non-Equilibrium & Reactive Flows



Uncertainty Quantification for RANS

3rd Annual SU2 Developers Meeting

September 16th-18th, 2018

University of Strathclyde, Scottish Universities Insight Institute (SUII)

Glasgow, Scotland, UK

SU2

The Open-Source CFD Code

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Meeting Agenda for Monday September 17th

0800 – 0830: Welcome & Year in review, *T. Economon (Bosch), J.J. Alonso (Stanford)*

0830 – 0900: SU2-NEMO - Thermochemistry and high-Mach aerothermodynamics, *M. Fossati (U. of Strathclyde), T. Magin, J.B. Scoggins, M. Pini, P. Colonna, R. Sanchez, T. Economon, D. Mayer, N. Beishuizen, C. Garbacz-Gomes, W.T. Meier, J.J. Alonso, T. van der Stelt*

0900 – 0930: Toward optimization for reactive flows in SU2, *N. Beishuizen (Bosch), D. Mayer, T. Economon*

0930 – 1000: Conjugate heat transfer problems and computing coupled discrete adjoints using AD, *O. Burghardt (TU Kaiserslautern), T. Albring, N. Gauger*

1000 – 1030: Coffee break

1030 – 1100: Physics-based RANS model-form UQ in SU2, *J. Mukhopadhaya (Stanford), A. Mishra, J.J. Alonso, G. Iaccarino*

1100 – 1130: Aeroacoustics prediction and optimization capabilities in SU2, *B. Zhou (NIA/NASA-Langley), T. Albring, N. Gauger, C. Ilario, T. Economon, J.J. Alonso, L. V. Lopes, H. Yao, S. Peng, L. Davidson*

1130 – 1200: Higher-order SU2: DG-FEM solver and WENO-FV solver with LES/ILES/WMLES applications, *E. van der Weide (U. of Twente), J.J. Alonso, D. Drikakis, K. Singh, P. Urbanczik, E. Molina, J.H. Choi*

1200 – 1300: Lunch

1300 – 1330: Unsteady optimization with SU2: application to turbomachinery design, *A. Rubino (TU Delft), M. Pini, N. Anand, P. Colonna*

1330 – 1400: Preliminary results on rotor-fuselage aerodynamics using SU2: status and challenges, *M. Morelli (Politecnico di Milano), G. Gori, A. Guardone*

1400 – 1430: Anisotropic mesh adaptation with the INRIA AMG library, *A. Loseille (INRIA), V. Menier, B. Munguia, J.J. Alonso*

1430 – 1500: Coffee break

1500 – 1530: Simulation and adjoint-based design for variable density incompressible flows with heat transfer, *T. Economon (Bosch)*

1530 – 1600: Implementation of pressure-based Navier-Stokes for wind energy applications, *A. Ravishankara (ECN part of TNO), H. Ozdemir, E. van der Weide*

1600 – 1630: SU2-IDS: International Developers Society, *T. Albring, R. Sanchez (TU Kaiserslautern), T. Economon, F. Palacios*

1630 – 1700: Wrap up, *J.J. Alonso (Stanford)*

In order to participate (in-person or virtually), please register for the meeting by following the link on the SU2 home page (https://su2code.github.io).

*Please note that all stated times are British Summer Time (BST). **The presenter author is underlined

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