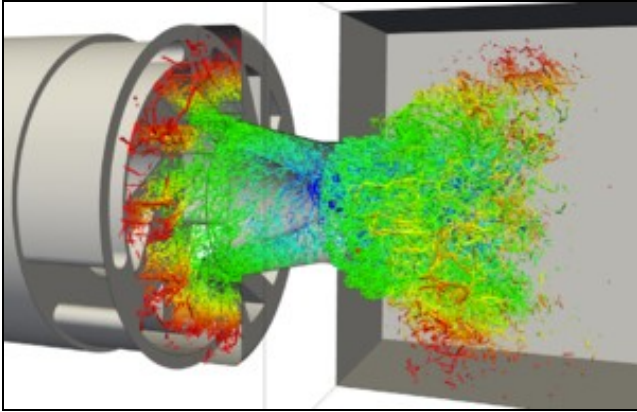


YALES2

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www.coria-cfd.frxxx-CustomPageTitleEnd-xxx



PRECCINSTA burner with YALES2 Contents

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Motivation

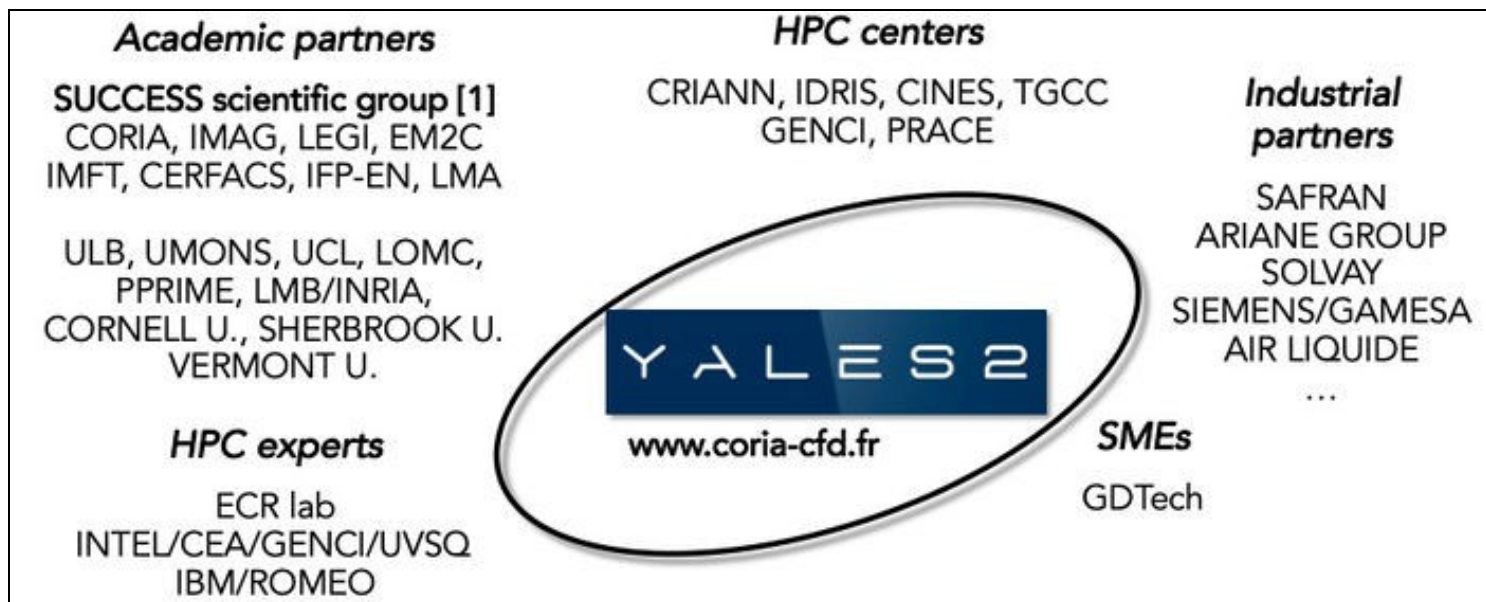
YALES2 aims at the solving of two-phase combustion from primary atomization to pollutant prediction on massive complex meshes. It is able to handle efficiently unstructured meshes with several billions of elements, thus enabling the Direct Numerical Simulation of laboratory and semi-industrial configurations.

YALES2 was developed from 2007 to 2010 by [V. Moureau](#) and is maintained since 2011 by [V. Moureau](#) and [G. Lartigue](#), joined later by P. Bénard and [K. Bioche](#) at CORIA and several other [people](#) in research laboratories.

More information may be found in the following presentation: [YALES2 presentation](#)

Community

YALES2 is developed by a large community with more than 500 researchers/engineers who were trained by the CORIA laboratory since 2009. The community regroups academic partners, HPC centers, industrial partners, HPC experts, SMEs and more. The code is also used for CFD training in academic courses at INSA of Rouen in the Energy and Propulsion department.



YALES2 network

Commitments

The YALES2 team is committed to supporting code users through training, meetings, projects or events.

Training

- General training sessions: 2x/year
- Two-phase flow training sessions: 1x/year
 - Tutorials: many/year
- Integrated in the INSA of Rouen curriculum

Support

- YALES2 users meetings: 2x/year
- Management of yales2.coria-cfd.fr: gitlab + centralized documentation
 - Dedicated contracts with industrial partners
- Support for submission of PRACE projects

Events & dissemination


- Extreme CFD workshop: 1x/year
- YACKATHON: 2x/year
- Participation to HPC projects: CVT GENCI and H2020 CoEC

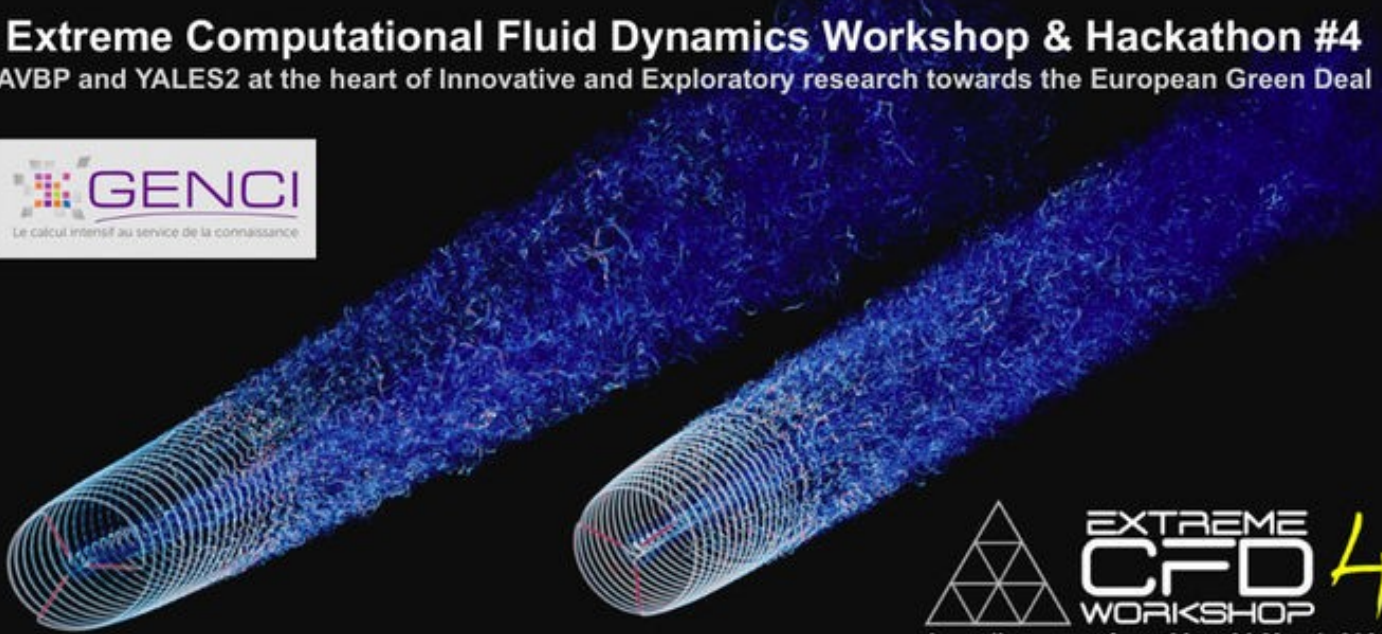



YALES2 team commitment

Here an example of event you can participate to:

Extreme Computational Fluid Dynamics Workshop & Hackathon #4
AVBP and YALES2 at the heart of Innovative and Exploratory research towards the European Green Deal

 GENCI
Le calcul intensif au service de la connaissance



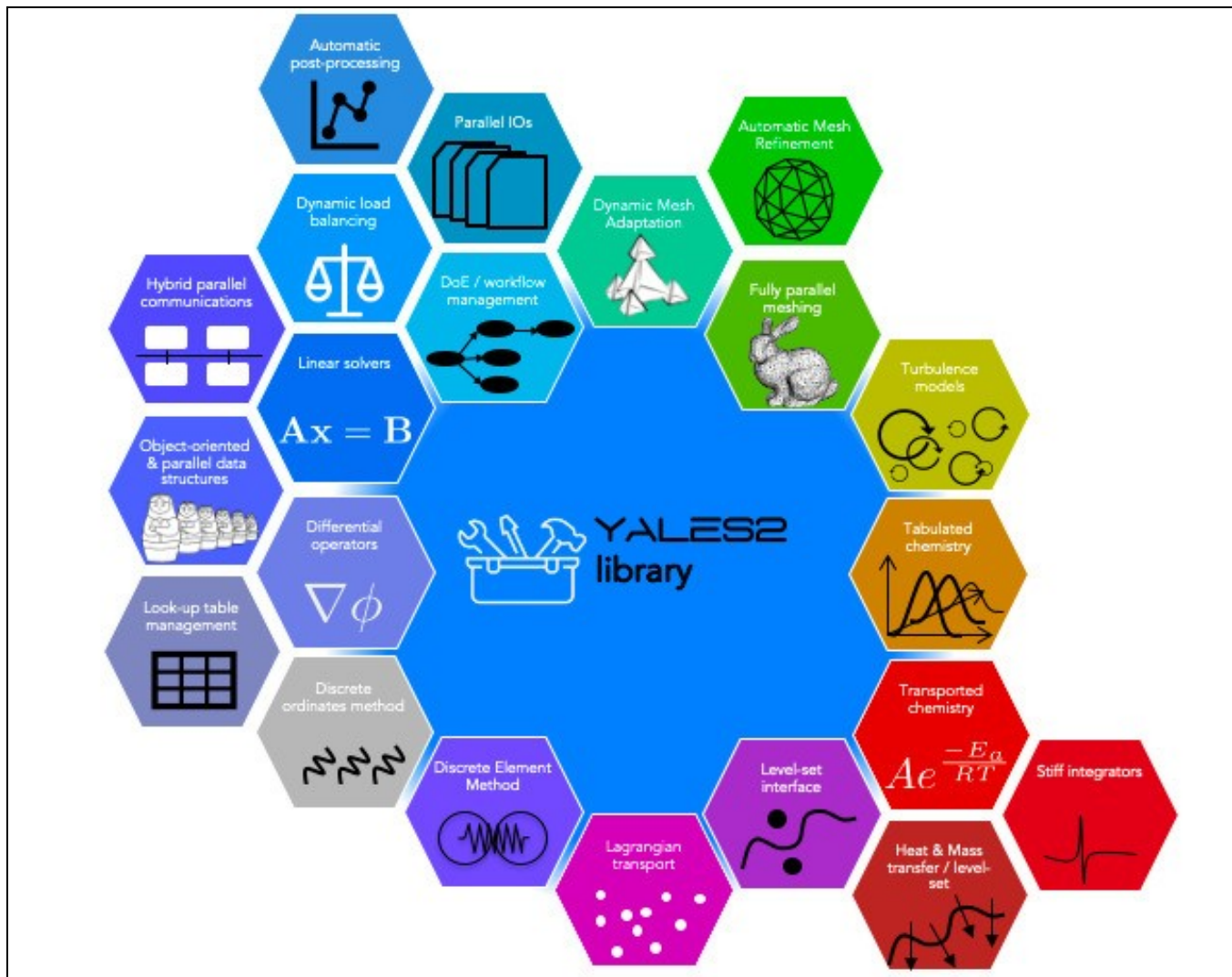
 **EXTREME CFD WORKSHOP 4**
An online event from 22 to 26 March 2021

Credit: Félix Houtin-Mongrolle @ CORIA

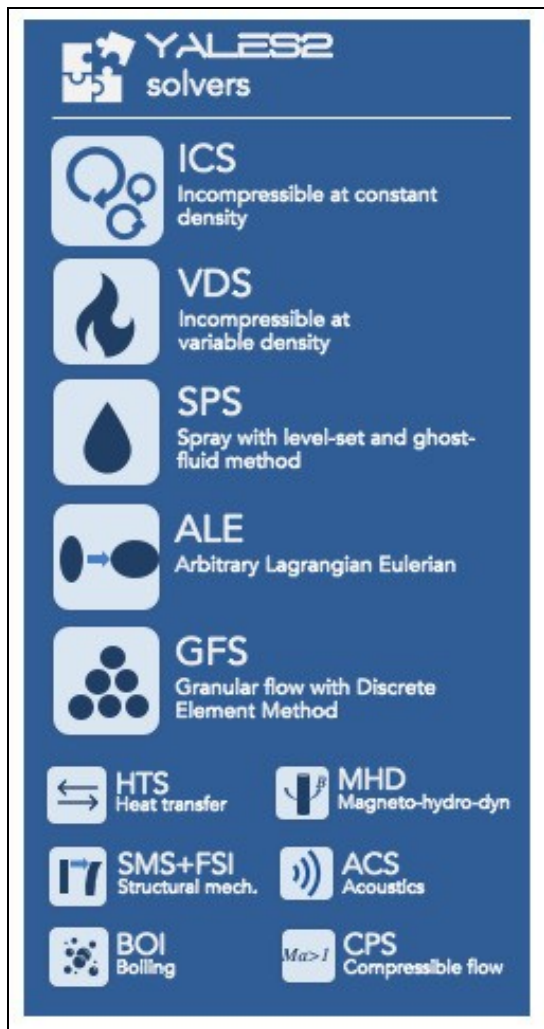
Extreme CFD event, https://ecfd.coria-cfd.fr/index.php/Ecfd:ecfd_4th_edition

YALES2 Library and solvers

The numerical library YALES2LIB consists of all the numerical methods required to develop solvers:



YALES2 library
We have plenty of solvers today, here are the main ones:



YALES2 solvers

Agile development

The fast development of the YALES2 platform comes mainly from the agile development project management methodology. It relies on a number of tools:

- programming: modular structure of the code with more than 200 objects and 420 modules
- non-regression and testing: private gitlab forge, nightly pipelines with more than 300 automatic jobs
- fast compiling: automatic dependencies, two pass compiling, 1m15s to compile 850'000 lines of fortran
- easy debugging: 2 compilation modes (optim, debug), many helpers (memory consumption, number of arrays, ...)

A few figures:

- 16 major releases since 2007
- 850 000 object-oriented Fortran 2008 lines for YALES2_2023.04
- 15 600+ commits
- 200+ active branches
- 1000+ merge requests
- 600+ members on the gitlab projects
- 100+ contributors

Gallery

Some computation examples are given in the [gallery](#) and on the Youtube video channel [\[1\]](#)