Giuseppe Indelicato

WORK EXPERIENCE

01/11/2018 – CURRENT

PHD STUDENT IN AERONAUTICAL AND SPACE ENGINEERING

Research field: turbulent combustion modeling in liquid rocket engine applications

Roma, Italy

20/03/2019 – 01/10/2021

REPRESENTANT OF PHD SCHOLARS AND RESEARCH FELLOWS AT THE DEPARTMENT COUNCIL, DEPARTMENT BOARD AND PHD ACADEMIC BOARD

01/02/2017 – 12/12/2017

COLLABORATION SCHOLARSHIP

Collaboration scholarship at the Department library for the academic year 2016/17

EDUCATION AND TRAINING

19/02/2021 – 18/07/2021 – United States

VISITING STUDENT – University of New Mexico

https://me.unm.edu

10/02/2019 – 15/02/2019

15TH ADVANCED SCHOOL ON PARALLEL COMPUTING – Partecipation sponsored by CINECA and PRACE

http://www.prace-ri.eu/

01/06/2018 – 25/06/2018

17TH CVA SUMMER SCHOOL – Community of Ariane Cities, European Space Agency (ESA), Escuela Tecnica Superior de Ingenieria

26/01/2018 – 06/02/2018

1ST CLEAN COMBUSTION WINTER SCHOOL – King Abdullah University of Science and Technology (KAUST)

01/10/2015 – 01/06/2017

MASTER'S DEGREE IN SPACE AND ASTROANUTICAL ENGINEERING

Thesis Title:
***RflameletPimpleSMOKE*: a numerical low Mach number solver for supercritical flames based on OpenFOAM**.

Abstract:
This thesis concerns the development of a numerical solver for the theoretical investigation of supercritical flames in Liquid Rocket Engines' (LRE) relevant conditions. In the context of the Steady Laminar Flamelets Theory (SLFM), it implements an innovative and efficient mixing model suitable for transcritical flames as those characterizing LRE, where the oxygen is usually injected into the combustion chamber under cryogenic conditions and pressure above the critical value.
Final Grade: 110 *cum laude* out of 110.

EQF level 7

01/10/2011 – 01/06/2015

BACHELOR DEGREE IN AEROSPACE ENGINEERING

Thesis title:
Analisi dinamica del comportamento di assorbitori di vibrazioni per applicazioni elicotteristiche.

Final Grade: 105 out of 110.

EQF level 6

LANGUAGE SKILLS

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

OpenFOAM (Optimal Knowledge) | object-oriented programming | ANSYS design modeler | GMSH | ParaView (Optimal Knowledge) | TECPLOT 360 | Intermediate programming skills in Fortran, C, C++, C#, Python and MATLAB | Windows Linux OS

PUBLICATIONS

An efficient modeling framework for wall heat flux prediction in rocket combustion chambers using non adiabatic flamelets and wall-functions

https://www.sciencedirect.com/science/article/pii/S0017931021000168 – 2021

Numerical investigation of high pressure CO2-Diluted combustion using a flamelet-based approach

https://www.tandfonline.com/doi/full/10.1080/00102202.2020.1811243 – 2020

Modeling the equations of state using a flamelet approach in LRE-like conditions

https://www.sciencedirect.com/science/article/pii/S0094576518303102?via%3Dihub – 2019

Simulation of a single-element GCH4/GOx rocket combustor using a non-adiabatic flamelet method

https://arc.aiaa.org/doi/pdf/10.2514/6.2018-4872 – 2018

Simulations of turbulent combustion and wall heat transfer in single and multi injectors GCH4/GOx rocket combustors

https://www.eucass.eu/doi/EUCASS2019-0353.pdf – 2019

A flamelet-based numerical framework for the simulation of low-to-high Mach number flows in LRE

https://arc.aiaa.org/doi/abs/10.2514/6.2020-3822 – 2020

Application of wall functions approaches in the context of LRE combustion chambers simulations

https://arc.aiaa.org/doi/abs/10.2514/6.2021-1375 – 2021

Effects of injector lateral confinement on LRE wall heat flux characterization: numerical investigation towards data-driven modeling

https://arc.aiaa.org/doi/abs/10.2514/6.2021-0416 – 2021

The effect of pressure on transcritical jets: A DNS study

https://www.eucass.eu/doi/EUCASS2019-0355.pdf – 2019

Thermal characterization in LRE: a parametric analysis on injector arrangement

https://arc.aiaa.org/doi/abs/10.2514/6.2021-3567 – 2021

PROJECTS

01/06/2020 – CURRENT

Collaborator in Avvio alla ricerca - Type 1 research project

2020: "Multi-fidelity numerical investigation of transcritical combustion and heat transfer in Liquid Rocket Engine propulsion systems"
PI: Arianna Remiddi (arianna.remiddi@uniroma1.it)
Prot. no.: AR120172B8EC304C
Valutation: 16/20
Funding: 1000 eur

01/10/2019 – CURRENT

Principal investigator and Collaborator in ISCRA-C/B grants

High Performance Computing (HPC) grants

2019 PI in Iscra-C "*Large Eddy Simulation of GOX-GCH4 multi-injectors rocket combustion chamber at elevated pressure*" code: HP10CPHKAL
Assigned budget**:** 35.000hs on MARCONI2, 5.809hs on M100

2020 Collaborator in Iscra-B code: HP10B4Z38R
Assigned budget: 35.000hs on MARCONI2, 5.809hs on M100
PI: Arianna Remiddi

2021 Collaborator in Iscra-C code: HP10CN0S3R
Assigned budget: 1.250.000hs on M100
PI: Pasquale E. Lapenna

2021 PI in Iscra-C "*Large Eddy Simulations of heated hydrogen pipes under trans- and super-critical pressure conditions*" code: HP10CHSLKU
Assigned budget**:** 30.720hs on M100

01/10/2019 – 01/06/2021

Principal investigator in Avvio alla ricerca - Type 1 research project

2019: "Multi-disciplinary modeling of injection, mixing and combustion in liquid rocket engines"
PI: Giuseppe Indelicato
Prot. no.: AR11916B88ED378F
Valutation: 16.5/20
Funding: 1200 eur

HONOURS AND AWARDS

10/11/2020

Winner of 2021 PhD Individual Mobility Scholarship

Winner of a fully funded scholarship (prot. no.: 0044296) for a five months period abroad within the PhD programme for the research project:
"MODELING HIGH PRESSURE COMBUSTION IN LIQUID ROCKET ENGINES"
Funding: 5000 eur

03/04/2018

Winner of a Ph.D student position in Fluid Mechanics – Department of Energy Sciences of Lund University

Winner for the two positions announced:

- Modeling bio-mass combustion in the OpenFOAM framework
- CFD study of gas turbine flows

06/02/2018

Best Presentation Award – King Abdullah University of Science and technology (KAUST)

For the project "High frequency laser optical diagnostic based on the Rayleigh scattering effect on an inverse
diffusion flame".

Presented at the 1st Clean Combustion Winter School held at KAUST, 2018