

MSCA-ITN-EID COMETE

Next-Generation Computational Methods for Enhanced
Multiphase Flow Processes

Kick-off Meeting & Initial Orientation Workshop

TU Wien, 22/10/2019



Agenda



9:15 - 9:30 Registration

9:30 - 9:40 Welcome to participants by chairman and local organiser

9:40 - 9:50 Presentation of project and management planning (C. Marchioli)

9:50 - 10:40 Scientific Planning - Part 1

9:50 - 10:15 WP1 - SPH for simulation of multiphase flows (E. Spricigo, J. Pozorski)

10:15 - 10:40 WP2 - Simulation of turbulent bubbly flows (G. Labanca, A. Soldati)

10:40 -11:00 Coffee Break

11:00 - 11:50 Scientific Planning - Part 2

11:00 - 11:25 WP3 - Simulation of particle-droplet interaction in turbulent three-phase flows (K. Miranda, C. Marchioli)

11:25 - 11:50 WP4 - Experimental development of improved freezing / defreezing procedure of Ammonia Heat Pipes (M. Mohaupt)

11:50 - 12:30 ESR Secondment and Career Development Planning

12:30 . 12:45 Planning of Training Activities

12:45 - 13:00 Planning of Dissemination/Communication/Outreach Activities

13:00 - 13:10 Closure of the Meeting

What is COMETE?



**Marie Skłodowska-Curie Actions (MSCA)
Innovative Training Networks (ITN)
H2020-MSCA-ITN-2018**

i About

Title: COMETE: Next-Generation
Computational Methods for Enhanced
Multiphase Flow Processes
Call: MSCA-ITN-2018-EID
Type of Action: MSCA-ITN-EID
Duration: 48 months
Project Start Date: 01/11/2018
Project End Date: 31/10/2022

WEBSITE:

158.110.32.35/COMETE/

In this project, we aim at building a computational framework and a network of competence to extend the applicability of state-of-the-art formulations to industrially-relevant multiphase turbulent flows. We focus on applications characterized by the transport of particles/droplets in two-phase flows with gas-liquid or liquid-liquid deformable interfaces, which are ubiquitous in process, chemical, and power engineering.

Partners



- Beneficiaries

Academic

UNIVERSITY of UDINE



TU WIEN



IMP-PAN GDANSK



Non Academic

**EURO
HEAT PIPES**



**EURO
HEAT
PIPES**

ESTECO



- Partner Organizations

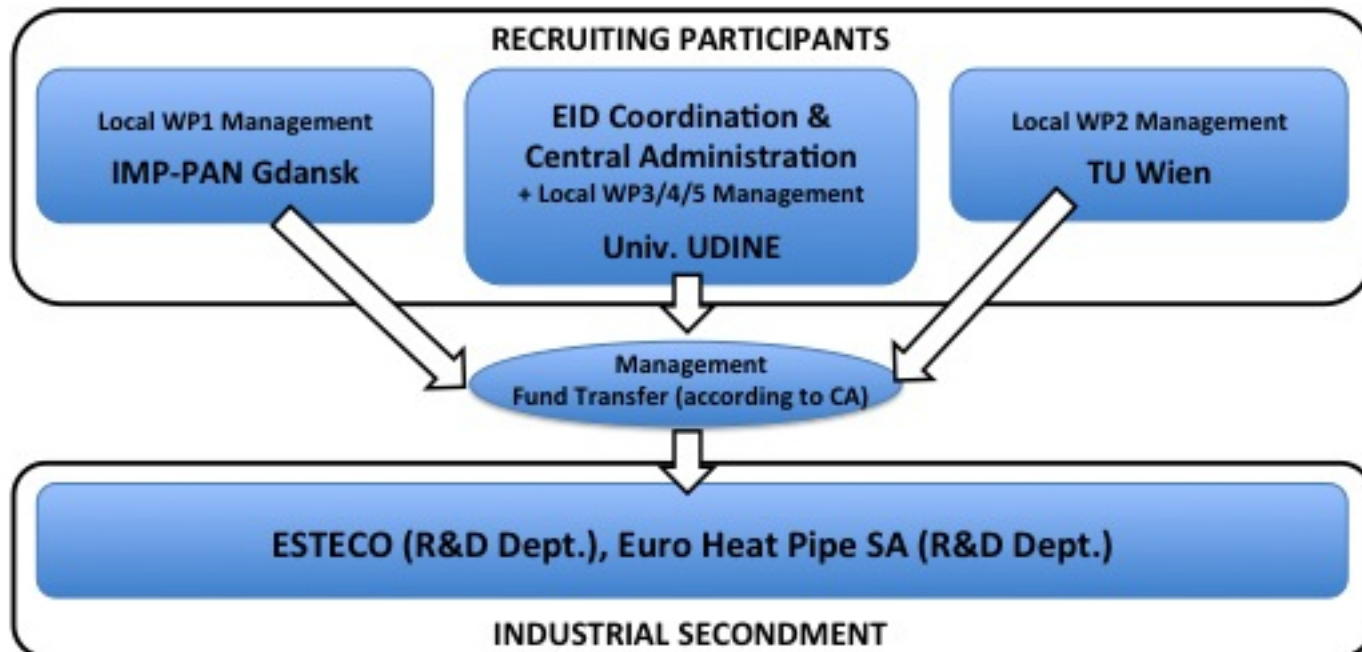


Governance



Supervisory Board

Cristian Marchioli	EID Coordinator, Outreach Coordinator, Representative of Univ. Udine
Alfredo Soldati	Research Coordinator, Representative of TU Wien
Jacek Pozorski	Training Coordinator, Representative of IMP PAN Gdansk
Mikael Mohaupt	Representative of EHP
Carlo Poloni	Representative of ESTECO
Sarah-Amalia Aronzohn	Project Officer



Management Planning



Nov.
2018

Aug.
2019

Oct.
2019

Oct.
2022



		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48						
Research activity	ESR 1																																																						
	ESR 2																																																						
	ESR 3																																																						
Training	Workshop																																																						
	Final Conference																																																						
	Visiting Scientist																																																						
	Advanced School																																																						
Management	Management Board																																																						
	Meetings																																																						
Dissemination/ Public engagement	Dissemination																																																						
	Public Engagement																																																						

- IO** = Initial Orientation workshop
- R** = Research workshop
- S** = Secondment of the academic ESRs into the non-academic sector (ESTECO, EHP)
- K** = Kick-off meeting
- E** = End of action

Management Planning



Deliverables, Ethics, DMP, Other Reports for Project 813948

Deliverables, Ethics, DMP, Other Reports						
WP No	Del Rel. No	Del No	Title	Lead Beneficiary	Dissemination Level	Est. Del. Date (annex I)
WP5	D5.10	D33	Supervisory Board of the network	UNIUD	Confidential, only for	31 Dec 2018
WP5	D5.12	D35	Consortium Agreement	UNIUD	Confidential, only for	31 Dec 2018
WP5	D5.14	D37	Data Management plan	UNIUD	Confidential, only for	30 Apr 2019
WP5	D5.1	D7	Overall recruitment	UNIUD	Confidential, only for	31 Jul 2019
WP6	D6.1	D32	EPQ - Requirement No. 1	UNIUD	Confidential, only for	31 Oct 2019
WP5	D5.11	D34	Progress Report	UNIUD	Confidential, only for	30 Nov 2019
WP5	D5.2	D8	Advanced training course 1	UNIUD	Confidential, only for	31 Jan 2020
WP5	D5.3	D9	Advanced training course 2	IMP-PAN	Confidential, only for	31 Jul 2020
WP5	D5.4	D10	Advanced training course 3	TU WIEN	Confidential, only for	31 Jan 2021
WP1	D1.1	D1	Technical and/or progress reports for WP1	IMP-PAN	Confidential, only for	31 Jul 2021
WP1	D1.2	D12	Transferrable skills from secondments at ESTECO	ESTECO	Confidential, only for	31 Jul 2021
WP1	D1.3	D13	Transferable skills ESR1	IMP-PAN	Confidential, only for	31 Jul 2021
WP1	D1.4	D19	Conference papers for WP1	IMP-PAN	Public	31 Jul 2021
WP2	D2.1	D2	Technical and/or progress reports for WP2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.2	D5	Software WP2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.3	D14	Transferable skills ESR2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.4	D20	Conference papers for WP2	TU WIEN	Public	31 Jul 2021
WP3	D3.1	D3	Technical and/or progress reports for WP3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.2	D4	Code tutorial	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.3	D6	Software WP3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.4	D15	Transferable skills ESR3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.5	D21	Conference papers for WP3	UNIUD	Public	31 Jul 2021
WP4	D4.1	D11	Transferrable skills from secondments at EHP	EHP	Confidential, only for	31 Jul 2021
WP4	D4.2	D22	Conference paper for WP4	EHP	Public	31 Jul 2021
WP1	D1.5	D23	Journal articles for WP1	IMP-PAN	Public	31 Jul 2022
WP1	D1.6	D27	Thesis of ESR1	IMP-PAN	Confidential, only for	31 Jul 2022

Management Planning



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WP1	D1.4	D19	Conference papers for WP1	IMP-PAN	Public	31 Jul 2021
WP2	D2.1	D2	Technical and/or progress reports for WP2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.2	D5	Software WP2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.3	D14	Transferable skills ESR2	TU WIEN	Confidential, only for	31 Jul 2021
WP2	D2.4	D20	Conference papers for WP2	TU WIEN	Public	31 Jul 2021
WP3	D3.1	D3	Technical and/or progress reports for WP3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.2	D4	Code tutorial	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.3	D6	Software WP3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.4	D15	Transferable skills ESR3	UNIUD	Confidential, only for	31 Jul 2021
WP3	D3.5	D21	Conference papers for WP3	UNIUD	Public	31 Jul 2021
WP4	D4.1	D11	Transferrable skills from secondments at EHP	EHP	Confidential, only for	31 Jul 2021
WP4	D4.2	D22	Conference paper for WP4	EHP	Public	31 Jul 2021
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WP1	D1.1	D1			Confidential, only for	31 Jul 2021
WP1	D1.2	D12			Confidential, only for	31 Jul 2021
WP1	D1.3	D13			Confidential, only for	31 Jul 2021
WP1	D1.4	D19				31 Jul 2021
WP2	D2.1	D2			Confidential, only for	31 Jul 2021
WP2	D2.2	D5			Confidential, only for	31 Jul 2021
WP2	D2.3	D14			Confidential, only for	31 Jul 2021
WP2	D2.4	D20				31 Jul 2021
WP3	D3.1	D3			Confidential, only for	31 Jul 2021
WP3	D3.2	D4			Confidential, only for	31 Jul 2021
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D6.1 – D32: The proposers should clarify if any of the ESRs will be involved in the experimental work and, if so, confirm that they will receive appropriate training, taking into account the possible risks. This should be done prior to any new experimental work being performed associated with the proposal.

Reporting



1. **CONTINUOUS REPORTING** – During the entire project, whenever needed
 - Deliverables / Milestones
 - Progress report (covers first 12 months of project, due: Nov 30, 2019)
 - Publications
 - Dissemination
 - Patents (IPR)
 - SME Impact – to be updated every year
 - Training activities
 - Questionnaires (for ESRs – Evaluation and Follow-up)
 - Continuous reporting functionality : activated at the beginning of the project and used continuously to submit deliverables

2. **PERIODIC REPORTING** – Within 60 days following the end of the RP ******
 - Two reporting periods
 - Months 1 to 24 (RP1)
 - Months 25 to 48 (RP2)
 - Includes financial reporting
 - Periodic reporting functionality : becomes active at the end of each RP and is used to provide additional information on the project

**** 60 days = deadline for Coordinator: Beneficiaries should provide input earlier!**

Reporting



PERIODIC REPORTING includes

- Technical report
 - Part A automatically created from Continuous Reporting
 - Part B – overview of the progress (uploaded as pdf)
- Financial report
 - Individual Financial Statement (IFS) from each beneficiary (Form C)
 - Explanation of use of resources
 - Periodic summary financial statement

PROCEDURE

- **Coordinator** prepares **Periodic Technical report**, based on the input from all beneficiaries
- **Beneficiaries** (including Coordinator) **prepare** their individual **Financial statements**, sign them electronically (FSIGN) and submit to Coordinator
- **Coordinator revises** Financial statements (can reject/ask for amendments)
- **Coordinator submits** all reports in one package **

*** The coordinator can submit a package without some Form Cs (e.g. beneficiaries don't submit Form C on time, blocking payment for whole network). Those beneficiaries will not be able to submit their Form C until the next reporting period!*

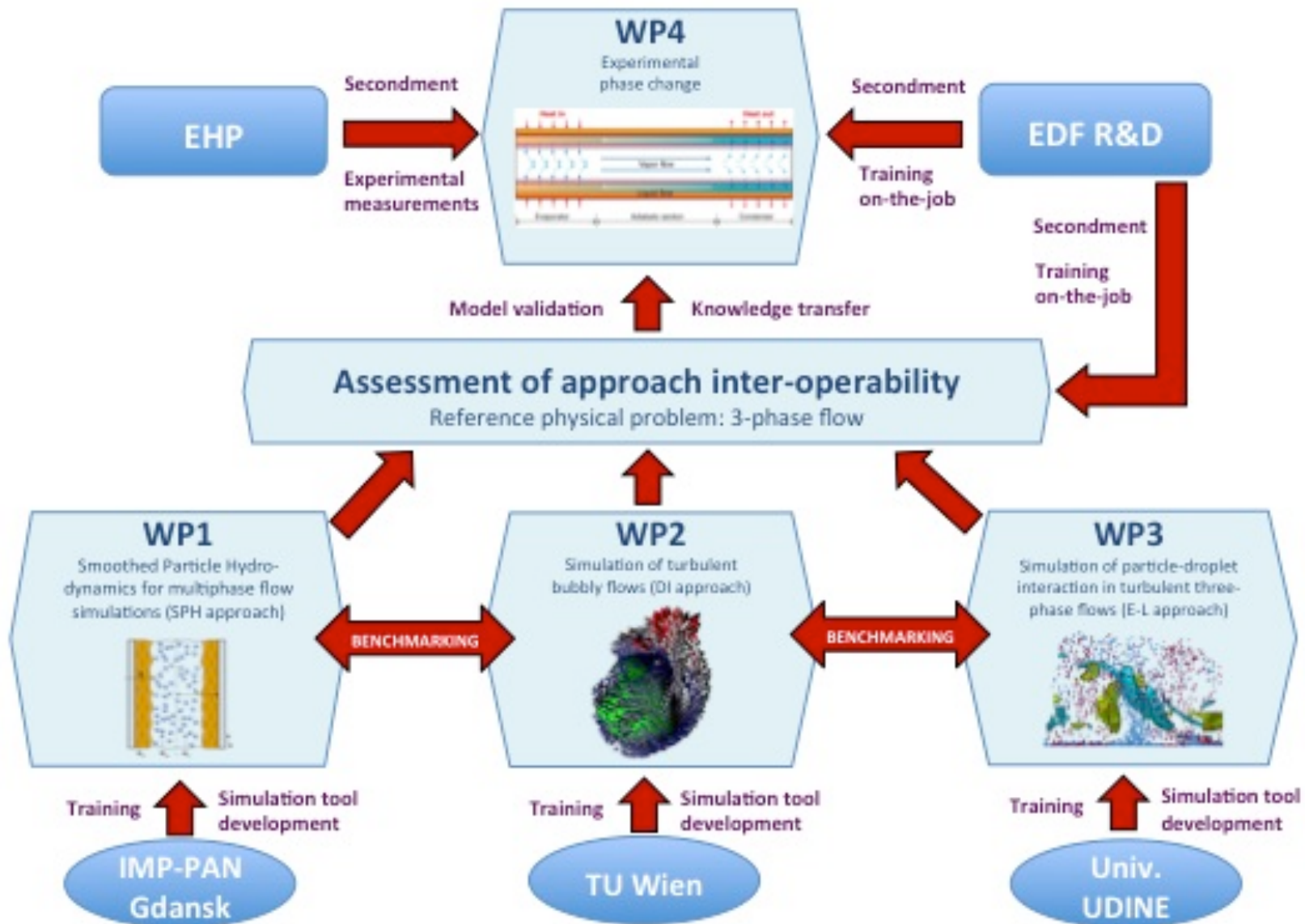
No payment would be made to them in this case until after the end of the project!

Scientific Planning



WP No.	WP Title	Lead Beneficiary No.	Start Month	End Month	Activity Type	Lead Beneficiary Short Name	ESR involvement
1	Smoothed Particle Hydrodynamics for simulation of multiphase flows	2	10	45	Research	IMP-PAN Gdansk	ESR 1
2	Simulation of turbulent bubbly flows	3	10	45	Research	TU Wien	ESR 2
3	Simulation of particle-droplet interaction in turbulent three-phase flows	1	10	45	Research	Univ. Udine	ESR 3
4	Experimental development of improved freezing /defreezing procedure of Ammonia Heat Pipes	5	22	45	Research	EHP	All ESRs
5	Coordination	1	1	48	Management, Training, Public Engagement, Dissemination, Outreach	Univ. Udine	None

Scientific Planning



Progress Monitoring



- *Initial Plan of Study (M10-M11)* - This will demonstrate that the researcher understands the problem and has a realistic research plan to tackle it. This plan will comprise a literature review, aims and objectives of the research, a Gantt chart with the main work items and milestones, and will be evaluated by the SB.

- *Early Stage Assessment (M18-M21)* - This will comprise a more in-depth literature review, the research aims and objectives, a description of the research methodology and any results obtained to date, and a more detailed Gantt chart including the main work items and milestones. The assessment will also include a presentation (e.g. as part of the usual research meetings at the host institution). Progress will be judged by the RC based on both the report and presentation.

- *Year One Progress Review (M21)* - This will comprise a two-page report by the supervisor and agreed with the doctoral researcher after a review meeting. It will focus on research outcomes including potential conference presentations and journal articles, and progress in training courses and transferable skills training.

- *Thesis Outline Review (M27)* - This will comprise an outline of the thesis structure (chapters and likely sub-headings), a review of conference presentations delivered and planned, a review of journal articles published, submitted and planned, and a Gantt chart of the time remaining before thesis submission. The assessment will also include a presentation, which can form part of the usual research meetings at the host institution. Progress will be judged by the SB based on both the report and presentation.

- *Year Two Progress Review (M33)* - This will comprise a two-page report by the supervisor and agreed with the ESR after a review meeting. It will focus on whether the doctoral researcher is on schedule to submit the thesis by the deadline and will form the final assessment stage prior to thesis submission.

- *Thesis Submission and Final Examination (M45)*

ESR Secondment & Career Development Plan (CDP)



SECONDMENT

Nov.
2018



Aug.
2019



Secondment
start dates

May 2020 Aug.
2020



Secondment
end dates

Oct. 2021 Jan.
2022



Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45							
ELEONORA																							S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S										
GABRIELE																							S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S										
KEVIN																				S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S																	

ACHTUNG, BITTE! Before starting the secondment, remember to fill the secondment plan!

CDP

- CDP template available as attachment of CA
- CDP needed well before due date of 1st-year Progress Report!

Training Activities



COMETE

TPST 1 Ethics and Scientific Conduct
<ul style="list-style-type: none">• Being a scientist: ethical principles (responsibility, accountability, conduct)• Consequences of scientific misconduct (in academic and industrial environments)• Gender, disability and diversity issues
TPST 2 Communication Skills
<ul style="list-style-type: none">• Organization and structure of a scientific presentation• Intended audience and presentation level (body language, eye contact)• Addressing problems and answering questions• Broad-audience dissemination and press release
TPST 3 Spin-off Companies and Intellectual Property Rights
<ul style="list-style-type: none">• IPR: Establishing ownership, responsibilities and liabilities; enforcement of rights• IPR types: Copyright, patent, trademark, industrial design• International patent system: Agreements and litigation• Technology transfer, commercial exploitation models• Do's and don'ts from COMETE industrial beneficiaries
TPST 4 Project Management
<ul style="list-style-type: none">• Effective project management: Practical model and key tools• Project meeting organization: Technical and steering Committee meetings• Reporting and dissemination of results; communication with EU and with partners
TPST 5 Scientific Writing
<ul style="list-style-type: none">• Communication: Why writing and effective reader targeting, writing for general public• Text structure: Text coherence and reinforcement, layout and structure• Principles of editorial work: do's and don'ts from COMETE participants serving as Editors
TPST 6 EU Funding: Opportunities and Practical Aspects
<ul style="list-style-type: none">• EU funding opportunities (within Horizon 2020 and beyond)• Individual projects and networks, Proposal writing
TPST 7 Career Review and Planning
<ul style="list-style-type: none">• Assessing individual development needs• Identifying future career directions• Plan of action for future career goals, CV writing

Training Activities



	Main Training Events & Conferences	ECTS	Lead Institution	Action Month
1	<p>Advanced Training School (ATS): <i>Direct numerical simulations of solid particles, drops and bubbles in turbulence</i></p> <ul style="list-style-type: none"> • Direct simulation approaches to HPC of multiphase flow • Interface capturing/tracking techniques • Collective particle/drop/bubble dynamics in turbulent flows, including heat transfer and phase change phenomena 	N/A	Univ. Udine	15 Jan 2020
2	<p>ATS: <i>Deposition, resuspension and agglomeration of particles in wall-bounded turbulence</i></p> <ul style="list-style-type: none"> • Phenomenology of multiphase wall-bounded turbulent flows • Unified particle deposition models (with combined hydrodynamic and physico-chemical approaches) • Experimental/modelling issues in multilayer deposition/resuspension 	N/A	IMP-PAN Gdansk	18 Apr 2020
3	<p>ATS: <i>Fluid dynamics effects in particle formation</i></p> <ul style="list-style-type: none"> • Introduction to turbulent particle aggregation and breakage • Derivation of breakage/aggregation rates from simulations • Population balance models for multiphase flows • Fully-resolved simulations for multiphase flows 	N/A	TU Wien	21 Jul 2020
4	<p>ATS: <i>Software Optimization and Uncertainty Quantification in Multiphase Flow CFD</i></p> <ul style="list-style-type: none"> • Introduction to Design of Experiments, Optimization algorithms and Surrogate modelling • Montecarlo, Lati Hypercube, Polynomial Chaos for UQ • Process automation for engineering models 	N/A	ESTECO	27 Jan 2021
5	Final Networking Conference	N/A	ESTECO	46

Dissemination, Communication & Outreach Activities



Communication and public engagement

Website	http://158.110.32.35/COMETE
Link to EU Societies & Associations	Euro-Science Open Forum (via ESTECO), ERCOFTAC, European Mechanics Society, EFCE, AIT, ANIMP, ...
Open Days	Public presentations, Lab tours
Science Festivals	European Researchers Night (Lange Nacht der Forschung)
Fluid Journeys	ESR's experience on social media
Promotional Videos	From simulations and experiments, put online

Dissemination of research

Conferences	ICMF, EFMC, ETC, T&I, ICNMMF, ...
COMETE's final conference	Month 46 (August 2022)
Scientific publications	Peer-reviewed journals, conference proceedings, ...
Website	ESR's homepage
Other	Outreach & Public Engagement events

Closure of the Meeting



**Thank you very much
for attending!**

Group Picture

