



DYNACOM European Industrial Doctorate (EID)

**Jornada informativa Acciones MSCA, Convocatoria
Innovative Training Networks (ITN) 2017**

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- One of the 7 **IMDEA** Institutes (water, food, energy, materials, nanoscience, networks and software) promoted by the Madrid regional government with **3 main goals**:
 - **Excellence in Materials Science and Engineering** research.
 - **Technology transfer to industry** to increase competitiveness and maintain technological leadership.
 - **Attraction of talented researchers** from all over the world to Madrid to work in an international and interdisciplinary environment.
- Well-established international reputation in processing, microstructural analysis, mechanical characterization and multiscale modelling of **advanced metallic materials and composites**.
- Around **95 workers** from **17 countries**, **50% of PhDs** granted **by foreign Universities**. Counts with a **Project Management Office (PMO)** of **5 members** to assist key researchers.



institute
iMdea
materials

<http://www.materials.imdea.org>

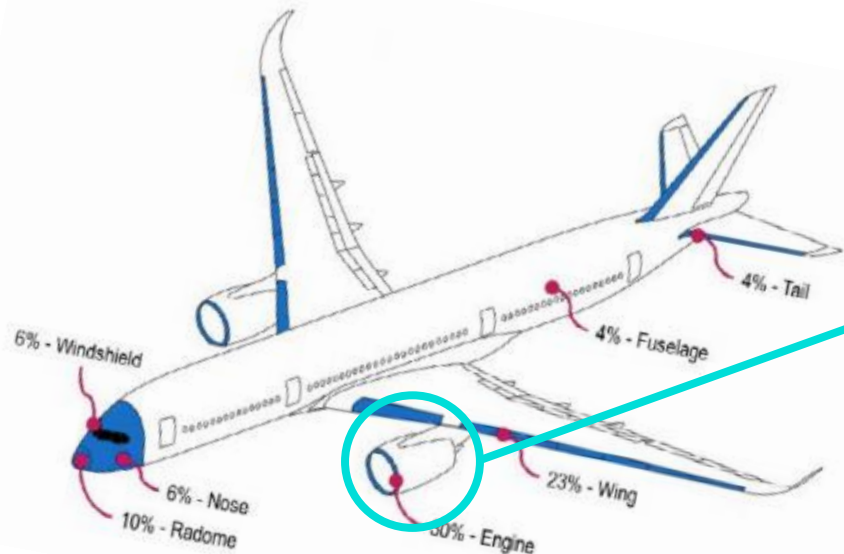
Innovative Training Networks (ITNs) are an
IDEAL INSTRUMENT to establish / consolidate
**STRATEGIC COLLABORATIONS WITH
INDUSTRY**



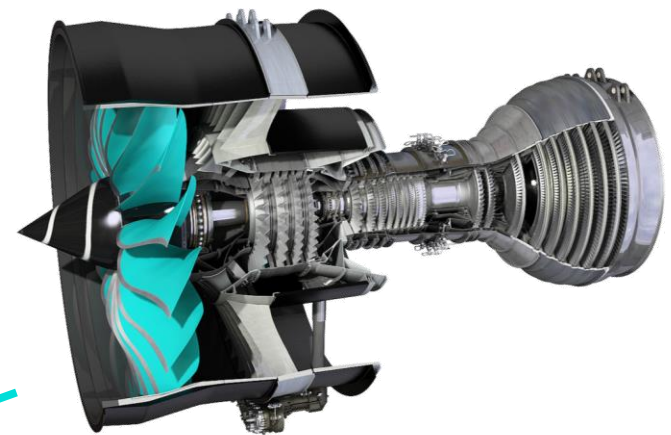
“Success consists of going from failure to failure without loss of enthusiasm” (Winston Churchill)

	2013	2014	2015	2016
ITN	MultiPro (ITN) ?%	-	FIREMOS (ETN) 89,40%	FIRE-TN (ETN) 69,60%
			NEWPOWER (ETN, <u>Coord.</u>) 71,00%	DYNACOMP (EID, <u>Coord.</u>) 93,40%
			ULTRAGLASS (ETN) 86,60%	ULTRAGLASS (ETN) 87,20%
			InnoX (ETN) 68,40%	DURACOMP (ETN) 63,60%
COFUND	-	-	AMAROUT III 67,00%	? 1 under evaluation
			NYRMANA 81,40%	
Individual Fellowships	1 IIF ? success rate	1 IF 20% success rate	1 IF 20% success rate	? IF 8 under evaluation

- **Composite materials** (plastics) are **heavily used in aeronautics** and represent up to 50% in weight (Airbus A350, Boeing B787 Dreamliner) for wings, fuselage sections and tail surfaces **due to their outstanding mechanical properties**.
- They do **also perform well in** other parts of the aircraft (**engines and nacelles**), however **experts do not yet understand why...**



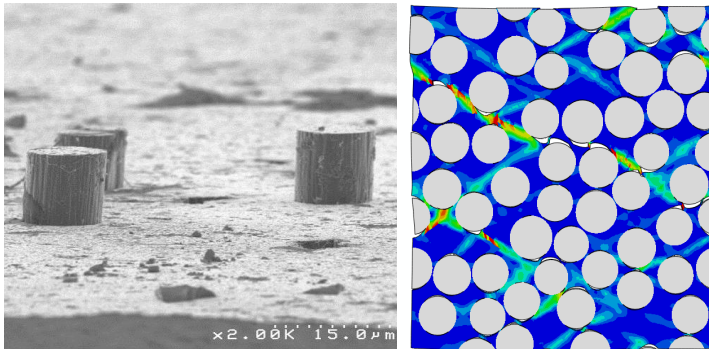
Strikes incidents in aircrafts



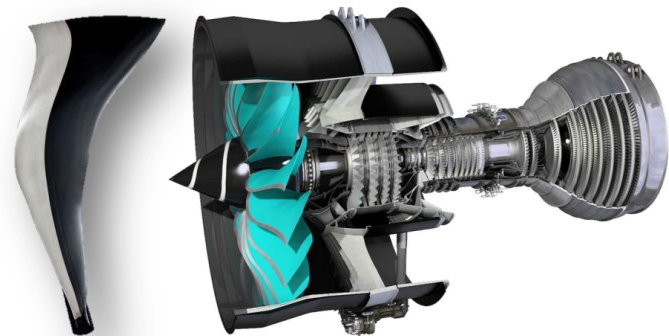
Rolls Royce UltraFan™

“could be ready for service from 2025 and will offer at least 25 per cent improvement in fuel burn and emissions against the same baseline” by the replacement of traditional metallic alloys by means of lighter composites (amongst others)

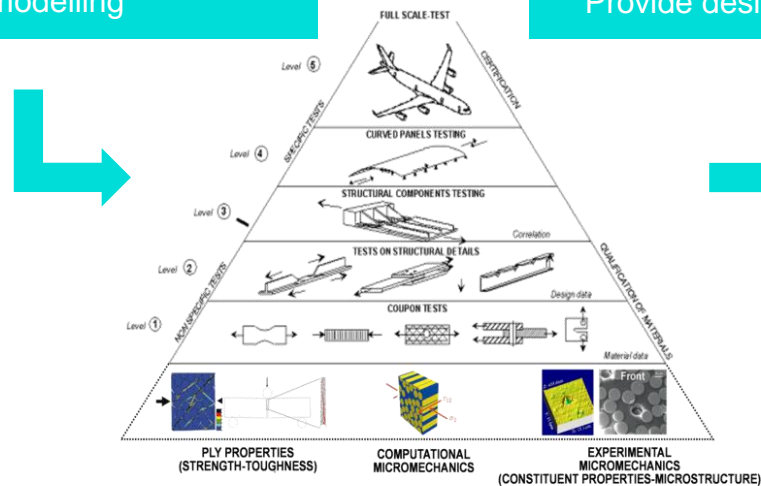
Build a new physically based **design paradigm**, based on a multiscale simulation strategy, for the **analysis of the dynamic and impact behaviour** of the **next generation of composite materials** to be used in **fan blade manufacturing**.



State-of-the-art in micro-mechanical testing
& multi-scale modelling



Virtual testing at the macroscale:
Provide design allowables to industry



Simplest consortium of all for an **EID** (European Industrial Doctorate): **2 Beneficiaries** & **3 Partner Organizations** (2 countries) to **train 2 ESRs** for a period of **48 months** (36 of which are funded):



COORDINATOR

- Research center
- 95 workers
- Leads the scientific direction of the programme (micro-mechanics & modelling)



- Private company
- 6000 workers
- € 1,7 Billion anual turnover
- Global producer of advanced composites (**END USER**)



- Private company
- 16 workers
- € 2,5 Million anual turnover
- Manufacturer of nanomechanical instruments



- Non-profit organisation
- 18 workers
- Supervises the training programme & delivers training



POLITÉCNICA

- University
- Awards the Doctoral degrees & will analyze the sustainability of the programme

Scientific coordinator at IMDEA Materials:

Dr. Jon Molina



WP n°	WP title	Area
1	Technical specifications and materials manufacturing	Scientific
2	Physical platform for materials characterization and parameter identification at the microscale	Scientific
3	Physical platform for materials characterization and parameter identification at the macroscale	Scientific
4	Modelling, simulation and correlation with experiments	Scientific
5	Training management	Non - Scientific
6	Project management	Non - Scientific
7	Dissemination and exploitation	Non - Scientific
8	<i>Ethics requirements (introduced during grant preparation)</i>	<i>Non - Scientific</i>

ESR n°	Research project title
1	Micromechanics of composite materials under high strain conditions
2	Dynamical response of composite materials under high strain conditions

The 2 ESRs will work half of their time (18 months) in industry and the other half in academia:

truly industrial involvement and commitment!

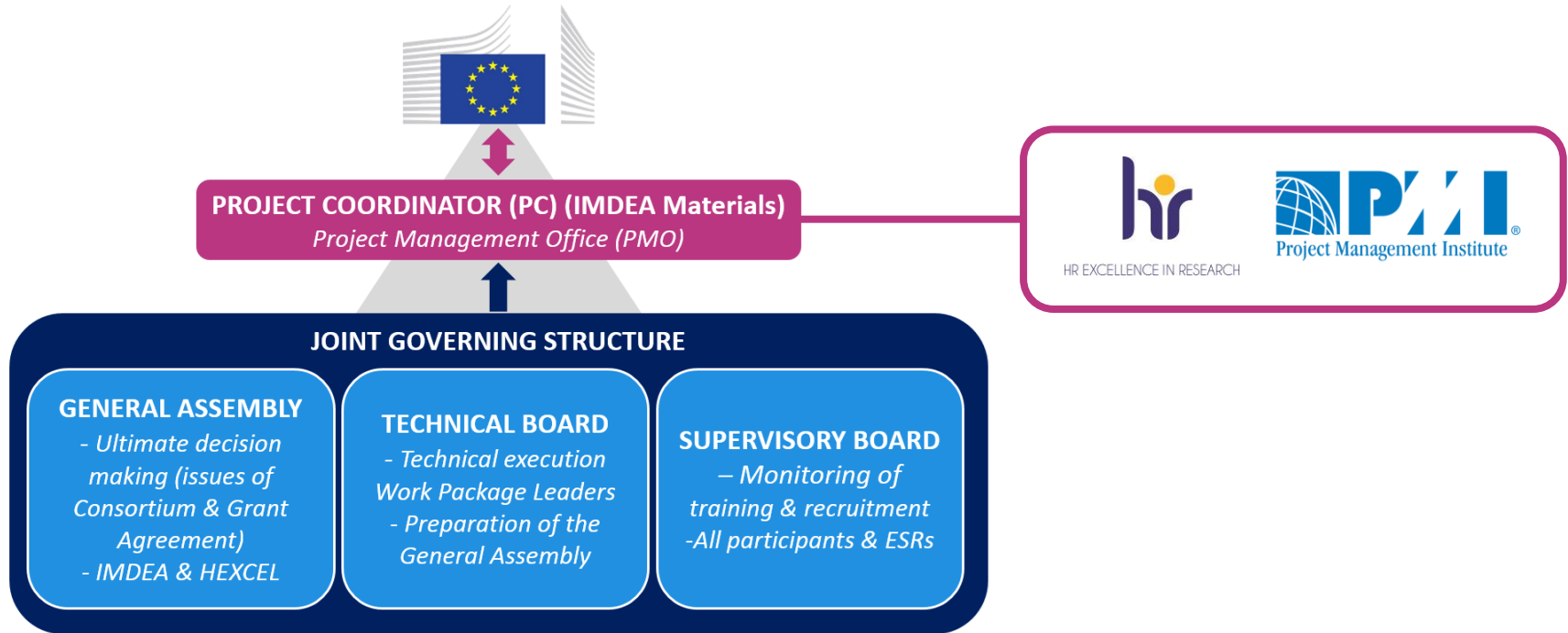
	2017				2018				2019			
ESR	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019
ESR1	Process Testing	Implementation of micromechanical testing methods				Micromechanical testing Micromechanical modelling						Testing Protocol
ESR2	Process Testing	High strain rate testing. Damage characterization. Multiscale models						Multiscale models Optimization of simulation strategy at industrial environ.				

 IMDEA
  HEXCEL
  Micro Materials

- Intensive and **interdisciplinary “training through research”** (chemistry of composites, manufacturing of composites, mechanical testing, modelling, advanced characterization, ...) **+** a comprehensive training programme on **transferable skills**.
- Budget is pretty generous. Therefore, **quite a few activities have to be proposed!**

Frequent types of network events / activities
Summer schools
Research and technology training at the Doctoral programme
Presentation at conferences and assistance to other type of events
Training in scientific dissemination, exploitation of results, gender, project management, entrepreneurship, ...
Workshops, elevator pitch, ...

- A **plain management structure** (with a lot of boards as requested ...) taking into account the small size of the consortium (may not work for larger endeavors ...)
- **“Excellence” in HHRR** (HRS4R) & strong support of a Project Manager / **Project Management Office** (PMI-trained) to ease the scientific coordinator’s work ... (i.e. hire a Project Manager): **every tenth of a point counts!**



- **Attractive conditions** to recruit excellent ESRs. But beware of the country correction coefficient!
- Very **simple at the proposal stage**, **not so simple under execution** (to be detailed in a [Consortium Agreement](#)). All ESRs recruited by IMDEA to ease the process + companies not interested in hiring (just interested in delivering the work).
- Make a basic **budget breakdown** to ensure that there will be enough funds for all planned activities & **agree** a distribution of the **Institutional Unit Costs** at the proposal stage.

Participant Number	Organisation Short Name	Country	IOEI	No of researchers	Number of person.months	Researcher Unit Cost			Institutional Unit Cost		TOTAL
						Living allowance	Mobility Allowance	Family Allowance	Research, training and networking costs	Management and overheads	
1	IMDEA	ES	no	2	72	218545,92	43200,00	18000,00	129600,00	86400,00	495745,92
2	HEXCEL	UK	no	0	0	0,00	0,00	0,00	0,00	0,00	0,00
Total				2	72	218545,92	43200,00	18000,00	129600,00	86400,00	495745,92

Salary cost of a project manager + organisation of review meetings & network events + travel expenses of everybody to review meetings & network events + website and promotional material + PhD tuition of the ESRs + additional living allowance of the 2 ESRs while seconded + consumables & other kind of goods and services needed by the 2 ESRs + overheads of everybody + reserve + ...



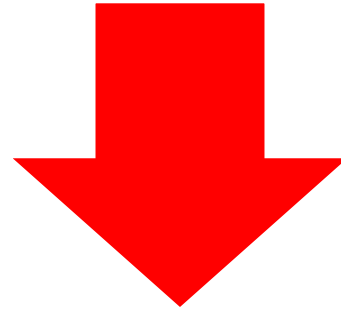
- **Build a sound idea & consortium.**
- **Coordinator** ends up doing the vast **majority of the work ...**
- **Obtaining timely feedback** from the proposal partners.
- Put the **right information in the right place** of the template (part B).
- **It is not all about excellence:** a coherent consortium and implementation is a must in this kind of (complex) networks (“If you don’t know how to plan it, you don’t know how to do it”). **Every tenth of a point counts!**
- Be able to tell a story and **engage the evaluator.**
- **Fit everything** in the **30 pages** of part B (a growing problem as the size of the consortium grows), taking into account the level of detail requested.
- Agreement on the **distribution of Institutional Unit Costs** (not in our case).
- **Call deadline** (10th of January 2017) is not the best one ...

A “Survivor’s guide to MSCA Innovative Training Networks” would be highly appreciated by the applicants!

DYNACOMP officially started on 1st of September 2016. The Kick-off has just been celebrated (18th of October 2016). The **recruitment process has just finished** (it took around 5 months) and we are **currently** carefully **planning** the incorporation of the 2 ESRs in January 2017.

- **Finding suitable candidates** due to companies' recruiting policies (ITAR restricted countries were not allowed).
- **Agree on a “final” version for the Consortium Agreement.**
- ??

Winning a proposal requires lots of planning and hard work + “a lucky strike”.



Excellent opportunity to collaborate with industry.

Excellent opportunity to carry out a PhD.

Level and amount of funding.

May lead to other networking opportunities.

Unit costs are very simple to manage (no *ex ante* audits).

Thanks!

“mixing business with science
is a path to success”

<http://dynacomp-project.eu/>