



# Welcome and introduction to the programme

Prof Andrew Cook, University of Westminster

Engage thematic challenge 4, 2nd workshop  
Madrid, 12NOV19



Founding Members



# The Engage KTN



# – the SESAR Knowledge Transfer Network

UNIVERSITY OF  
WESTMINSTER



FREQUENTIS



[engagektn.com](http://engagektn.com)

 [twitter.com/EngageKTN](https://twitter.com/EngageKTN)

# Industry partners



Advanced Logistics Group (ALG)  
 AGIFORS - Airline Group of the International Federation of Operational Research Societies  
 Air Traffic Controllers European Unions Coordination (ATCEUC)  
 airBaltic  
 Airport Regions Conference (ARC)  
 American Airlines  
 ANS CR  
 Aslogic  
 Association for the Scientific Development of ATM in Europe (ASDA)  
 Autoridade Nacional da Aviação Civil (ANAC)  
 Barcelona Supercomputing Center (BSC)  
 Boeing Research and Technology Europe (BR&T-Europe)  
 Bundesverkehrsministerium für Flugsicherung (BAF)  
 Civil Aviation Authority (CAA)  
 COOPANS Consortium  
 Department for Transport (UK)  
 Direction des Services de la Navigation Aérienne (DSNA)  
 Direktorat civilnog vazduhoplovstva Republike Srbije (DCV)  
 European Meteorological Services Network (EUMETNET)  
 European Passengers' Federation (EPF)  
 Executive Airlines  
 Ferrovial Agroman  
 Finnair  
 FlightGlobal  
 Flughafen München / Munich Airport  
 Gestair SL  
 Helios  
 HEMAV - High Endurance Multipurpose Aerial Vehicles  
 Honeywell Aerospace  
 HungaroControl  
 Icelandair  
 IFSTTAR - Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux  
 INFORM - Institut für Operations Research und Management GmbH  
 International Air Transport Passenger Association (IATPA)  
 International Federation of Air Traffic Controllers' Associations (IFATCA)  
 International Federation of Air Traffic Safety Electronics Associations (IFATSEA)  
 Irish Aviation Authority (IAA)  
 LFV - Luftfartsverket  
 London Luton Airport  
 Lufthansa Systems  
 Manchester Airport  
 NATS  
 Naviair  
 Network Manager - nominated by the European Commission  
 NEXTOR II Consortium - University of California, Berkeley and University of Maryland  
 PACE Aerospace Engineering & Information Technology  
 Pegasus Airlines  
 QinetiQ Ltd  
 Raytheon UK  
 Sabre Airline Solutions  
 skeyes  
 SWISS - Swiss International Air Lines  
 TÜBİTAK - The Scientific and Technological Research Council of Turkey  
 Turkish Airlines

# SESAR KTN: 2018 – 2021

- ‘One-stop’ European knowledge hub, concepts roadmap, research repository
  - 4x SESAR Innovation Days (Athens 02-06 Dec.)
  - 12 thematic challenge workshops
  - 3 European summer schools (Belgrade '19, Luxembourg '20, Trieste '21)
  - 10 PhDs; interdisciplinary
  - 16+ catalyst fund projects (TRL pipeline)
- 
- Undergraduate & postgraduate teaching & training initiatives
  - Internships & employer links
  - Travel & journal publication grants
  - Student mobility
- 

**Integrate  
IR and ER**

**35% of €4m as  
consortium  
effort**


**More in  
Athens ...**


# Belgrade summer school

## Dissemination for 2019

[ABOUT SESAR](#)[APPROACH](#)[ACTIVITIES](#)[IN ACTION](#)

# ENGAGE KTN SUMMER SCHOOL 2019

 9<sup>th</sup> of September  
13<sup>th</sup> of September, 2019

 Faculty of Traffic and Transport  
Engineering (Vojvode Stepe 305)  
Belgrade, Serbia

[Map](#)

The first summer school organised by the Engage KTN will take place 09-13 September 2019, in Belgrade, Serbia.

One of the key remits of the KTN is provision of high quality education and training in the field of air traffic management, by means of gathering together postgraduate students, experienced researchers and industry representatives. To that end, the summer school will include tutorials on key ATM concepts and challenges as well as on research methodologies, including case studies and presentations of prominent SESAR exploratory research projects.



Please visit [engagektn.com/summer-school-2019](http://engagektn.com/summer-school-2019) for further information and the application form.

Attendance to the summer school is free of charge, however places are limited. A number of student travel bursaries are available to support student attendance. Interested postgraduate students should [send the filled application form](#) no later than 20 June 2019. Notification of acceptance/rejection will be provided by 26 June 2019.

HIGH- PERFORMING  
AVIATION FOR  
EUROPE



SESAR JU E-News - May 2019

Project of the month - News - Events - Publications

### Engage KTN summer school 2019

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[Read more](#)

# Thematic challenges

## Background

[HOME](#)[ABOUT](#)[KNOWLEDGE HUB](#)[PARTICIPATE](#)[EVENTS](#)[CONTACTS](#)

## Engage Thematic Challenges

At the core of the KTN is the definition of various thematic challenges: new ideas suggested by the research community, not already included within the scope of an existing SESAR project. They are developed along with the ATM concepts roadmap and complementarily with some of the network's PhDs and theses.



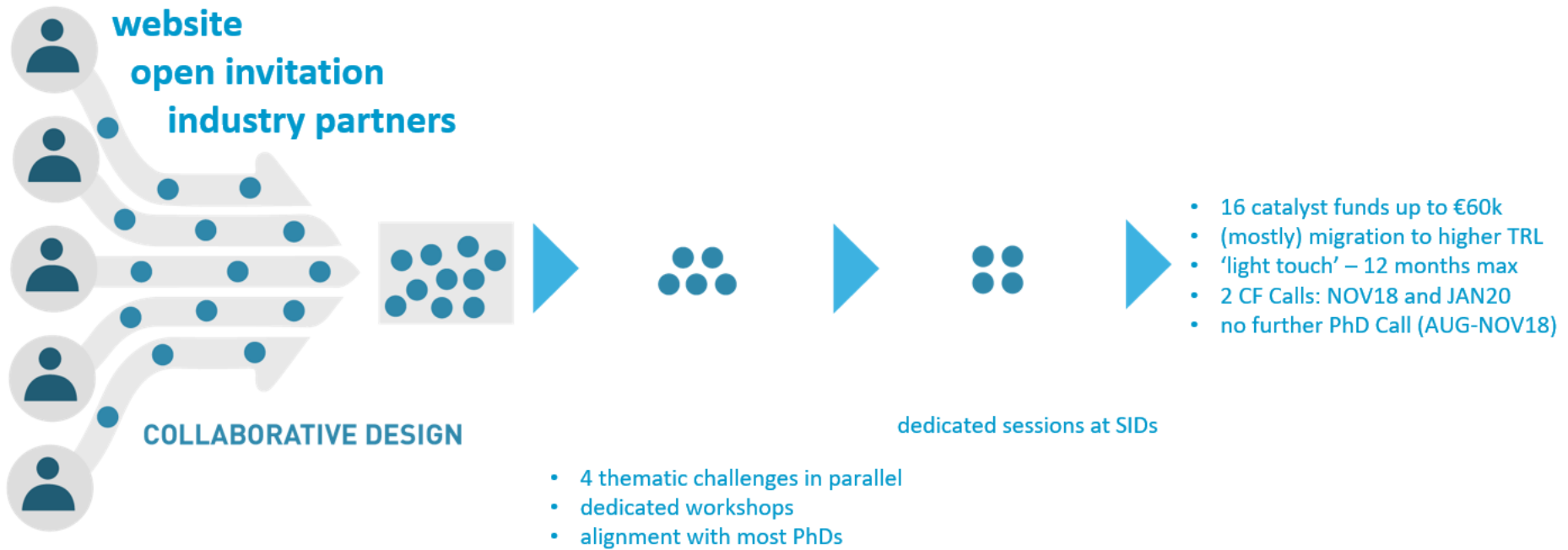
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# Thematic challenges

## Background





# Catalyst funding

10 awards made, up to €60k per project (H2020 limit)

Title	TC1	TC2	TC3	TC4	Lead contact	Coordinator	Inst. 2	Inst. 3	Inst. 4
Authentication and integrity for ADS-B	✓				Prof Dr-Ing Jens Schmitt	TU Kaiserslautern	SeRo Systems (DE)		
The drone identity - investigating forensic-readiness of U-Space services	✓				Dr Yijun Yu	Open University (UK)	NATS		
Data-driven trajectory imitation with reinforcement learning		✓			Prof George Vouros	University of Piraeus	Boeing RTE		
A Data-driven approach for dynamic and Adaptive trajectory Prediction (DIAPasON)		✓			Álvaro Rodríguez Sanz	CRIDA	Deep Blue	ZenaByte (IT)	
An interaction metric for an efficient traffic demand management: requirements for the design of data-driven protection mechanisms		✓			Dr Juan José Ramos	Aslogic (ES)			
Probabilistic weather avoidance routes for medium-term storm avoidance (PSA-Met)			✓		Prof Damián Rivas	University of Seville	MeteoSolutions (DE)		
Airport-sCAle severe weather nowcasting project (CARGO)			✓		Dr Riccardo Biondi	University of Padova	LMU Munich	GReD srl (IT)	Leonardo (DE)
Operational alert Products for ATM via SWIM (OPAS)			✓		Dr Hugues Brenot	Royal Belgian Institute for Space Aeronomy			
MET enhanced ATFCM			✓		Gladys Mercan	DSNA Services	MetSafe (FR)		
Exploring future UDPP concepts through computational behavioural economics				✓	Ricardo Herranz	Nommon Solutions and Technologies			

# Engage PhDs

10 PhDs launched, up to €150k directly per thesis

Title	TC1	TC2	TC3	TC4	Supervisor	Proponent	Inst. 2	Inst. 3	Inst. 4	Co-fund?
Decision support system for airline operation control hub centre ('DiSpAtCH')					Prof Dr-Ing Peter Hecker	TU Braunschweig	Jeppesen			✓
Trajectory planning for conflict-free trajectories: a multi agent reinforcement learning approach		✓			Prof George Vouras	University of Piraeus Research Center	CRIDA			
Detection, classification, identification and mitigation of GNSS signal degradations by means of machine learning					Prof Nicolas Couellan	ENAC	Uni. Oklahoma			✓
Machine learning techniques for seamless traffic demand prediction		✓			Dr Xavier Prats	Nommon	UPC			✓
Machine learning applications to extend agent's conflict resolution capabilities		✓			Dr Miquel Angel Piera	Autonomous Uni. of Barcelona	ASLOGIC			✓
Integrating weather prediction models into ATM planning ('IWA')		✓	✓		Dr Valentin Polishchuk	Linköping University	LFV	Uni. Sevilla		✓
Advanced statistical signal processing for next generation trajectory prediction		✓			Dr Xavier Prats	Universitat Politècnica de Catalunya	ISAE-SUPAERO			✓
A pilot/dispatcher support tool based on the enhanced provision of thunderstorm forecasts considering its inherent uncertainty ('STORMY')			✓		Dr Manuel Soler	Universidad Carlos III de Madrid	ETH Zürich	Spanish Met Office	GTD Systems	✓
2nd generation agent-based modelling for improving APOC operations				✓	Prof Daniel Delahaye	Amsterdam University of Applied Sciences	ENAC	Uni. Paul Sabatier		✓
Stochastic control of tactical airline operations in hub-airport networks				✓	Prof Dr-Ing Hartmut Fricke	TU Dresden				

# Thematic challenges

## Taking stock

	TC1	TC2	TC3	TC4
PhDs	-	5	2	2
Catalyst fund projects	2	3	4	1

# Thematic challenge workshops

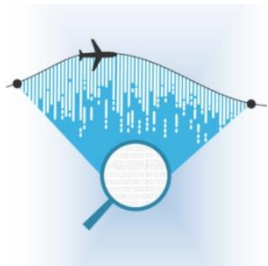
2019-2020



## #1. CNS vulnerability and security

2020 – TBC; Delft / Köln (?)

Paula López, Innaxis



## #2. Data-driven trajectory prediction

02 December 2019, Athens (co-located with SIDs)

Dirk Schaefer, EUROCONTROL



## #3. Efficient use of MET data

05 November 2019, SJU, Brussels

Tatjana Bolić, University of Trieste



## #4. Novel market mechanisms in ATM

12 November 2019, Nommon, Madrid

Andrew Cook, University of Westminster

**Integrate: PhDs,  
CFs, & wider  
community**

**Promotion  
since August;  
SESAR e-news**

# Today's programme

# Today's programme

## Flow and content

### Flow and content overview (*simplified*)

- Background and (wider) context
- PhDs, CF project, industry
- Facilitated exercise (CF project focus)
- 1715-1730 – wrap-up and next steps (punctual)
- Technical workshop ideas

### Housekeeping

- Slides will be put on Engage website (after approval from speakers)
- Expense claim forms for speakers (& student applicants)





# Welcome and introduction to the programme

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## Thank you



This network has received funding from the SESAR Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 783287.



Founding Members



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