ERC KARST Workshop Barcelona CosmoCaixa Museum 2-4 June 2025

Funded by the European Union (ERC, KARST, 101071836)

Day 1 **Caves** **Sala Tau**

Start	End	**Moderator:** *Benoit Noetinger*	**Speaker**
9:00	9:10	Welcome, summary and general vision	Marco Dentz
9:10	9:40	Challenges and open questions in conduit turbulence	Frederic Douarche
9:40	10:10	Overview of experiments in conduits and pipes	Torsten Noffz
10:10	11:00	*Coffee Break*	
11:00	12:00	Cave conduit data and characterization	Tanguy Racine
12:00	12:30	3D printing of cave conduits	Salim Bocanegra
12:30	13:00	CFD simulations of conduit flow	Ismail El Mellas
13:00	14:30	*Lunch Break*	
14:30	15:30	Laboratory experiments	Matthieu Cordier
15:30	16:00	Upscaling of conduit flow laws: State of the art	Torsten Noffz
16:00	16:30	Effective Darcy-Weisbach for variable diameter conduit	Philippe Renard
16:30	17:00	*Coffee Break*	
17:00	18:00	Upscaling of conduit transport laws: State of the art	Kostantinos Feroukas
18:00	20:00	Discussion and further steps	

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Day 2 **Networks** **Sala Tau**

Start	End	**Moderator:** *Marco Dentz*	**Speaker**
9:00	9:10	Summary and General Vision--Speleogenesis	Philippe Renard
9:10	10:00	Challenges and open questions in speleogenesis	Franci Gabrovsek
10:00	10:30	Analog experiments	Sylvie Schueller
10:30	11:00	Dissolution in a single fracture	Matija Perne
11:00	11:30	*Coffee Break*	
11:30	11:40	Summary and General Vision--Networks	Bojan Mohar
11:40	12:15	Karst network database	Celia Trunz
12:15	13:00	Fractal characterization of karst networks	Julien Straubhaar
13:00	14:30	*Lunch Break*	
14:30	15:30	Network analysis	Bojan Mohar
15:30	16:00	Network analysis	Sergio Cabello
16:00	16:30	Network analysis	Jose Alvarado
16:30	17:00	*Coffee Break*	
17:00	20:00	Discussion and further steps	
20:30		Dinner at Restaurante "El Quixote"	

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Day 3 **Network Flow** **Sala Tau**

Start	**End**	**Moderator:** *Philippe Renard*	**Speaker**
9:00	9:10	Summary and General Vision	Benoit Noetinger
9:10	10:00	Network scale flow	Jannes Kordilla
10:00	11:00	Network scale transport	Tobias Grundhöfer
11:00	11:30	*Coffee Break*	
11:30	12:00	Catchment scale modeling: Case study	Manon Trottet
12:00	12:30	Network flow upscaling	Ivan Colecchio
12:30	13:00	Network flow upscaling	Benoit Noetinger
13:00	14:30	*Lunch Break*	
14:30	15:30	Graph simplification	Yousra Housni
15:30	16:30	Network transport upscaling	Marco Dentz
16:30	17:00	*Coffee Break*	
17:00	20:00	Discussion and further steps	

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ERC KARST Summer-School Barcelona CSIC 5-6 June 2025

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Day 4 **Networks** **IDAEA Seminar A**

Start	End		Speaker
9:00	9:30	Troubleshooting packages installation + coffee	
9:30	10:00	Structure and content of the ERC-Karst network data base	Celia Trunz
10:00	10:30	Lab 1: Accessing and visualizing the data sets	Celia Trunz and Julien Straubhaar
10:30	11:00	*Coffee Break*	
11:00	11:20	Basis of simulating networks with pyKasso	Philippe Renard
11:20	11:45	Lab 2: Generating a simple 2D network	Philippe Renard and Manon Trottet
11:45	12:15	Making the models more realistic	Philippe Renard
12:15	13:00	Lab 3: Generating a 3D network with geological data	Philippe Renard and Manon Trottet
13:00	14:00	*Lunch Break*	
14:00	14:20	Characterizing networks with NetworkX and Karstnet	Julien Straubhaar
14:20	15:00	Lab 4: Importing a network and simple statistics	Julien Straubhaar and Celia Trunz
15:00	15:20	Power laws and fractal dimensions	Julien Straubhaar
15:20	16:00	Lab 5: application on synthetic and real networks	Julien Straubhaar and Celia Trunz
16:00	16:30	*Coffee Break*	
16:30	17:00	Open session on implementing efficient inversion of Laplacians	Yousra Housni
17:00	17:30	Discussion on Graph similarity	

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Day 5 **Network flow** **IDAEA Seminar A**

Start	End		Speaker
9:00	10:00	Troubleshooting packages installation + coffee	Jannes Kordilla
10:00	11:00	Hands-on with OpenKarst	Jannes Kordilla
11:00	11:30	*Coffee Break*	
11:30	13:00	Hands-on with OpenKarst	Jannes Kordilla
13:00	14:30	*Lunch Break*	
14:30	15:30	Hands-on with OpenKarst - follow up and discussion	Jannes Kordilla
15:30	16:30	Simulation of steady flow and solute transport in karst networks	Marco Dentz/Tobias Grundhöfer
16:30	17:00	*Coffee Break*	
17:00	18:00	Discussion	