

eurokarst 2022

MÁLAGA
22 - 25 June

The European Conference on Karst Hydrogeology and Carbonate Reservoirs

CONFERENCE PROGRAMME

Photo: Juan Antonio Barberá Fornell



CEHYUMA
CENTER OF HYDROGEOLOGY
OF UNIVERSITY OF MALAGA



CSIC

Instituto Geológico y Minero de España

**UNIVERSITÉ DE
FRANCHE-COMTÉ**

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Université de Neuchâtel

EUROKARST 2022

Conference programme

The European Conference on Karst
Hydrogeology and Carbonate
Reservoirs

Málaga (Spain), June 22-25, 2022

Editors:

José Manuel Gil Márquez

Bartolomé Andreo Navarro

Juan José Durán Valsero

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TABLE OF CONTENTS

COMMITTEES.....	4
SCIENTIFIC PROGRAMME	6
VENUE	7
PROGRAMME AT-A-GLANCE	8
PRE-CONGRESS EVENTS.....	9
TUESDAY 21 ST	10
WEDNESDAY 22 ND	10
THURSDAY 23 RD	11
FRIDAY 24 TH	13
SATURDAY 25 TH - FIELD TRIPS	14
PARALLEL SESSIONS PROGRAMME.....	15
POSTER SESSIONS PROGRAMME	24

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- | | |
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| Hervé Jourde University of Montpellier2, France | Pierre Yves Jeannin SISKA, Switzerland |

SCIENTIFIC PROGRAMME

Topic 1 – Karst geomorphology, landscape, and cavities

Wednesday 22nd – From 10:00 to 16:10 –

- Two keynote lectures
- Three oral sessions
- One poster session

Topic 2 – Methods to study karst aquifers

Wednesday 22nd – from 15:10 to 18:00 - and Thursday 23rd – all day –

- Two keynote lectures
- Nine oral sessions
- One poster session

Topic 3 – Karst hydrogeology

Friday 24th – all day –

- One keynote lecture
- Six oral sessions
- One poster session

VENUE

Congress Venue

Facultad de Derecho (Law Faculty)
University of Málaga

Av. Louis Pasteur, 26
29071 Málaga



Venue
plan

PROGRAMME AT-A-GLANCE

Program at a Glance

Time	Monday 20 th	Tuesday 21 th	Wednesday 22 th	Thursday 23 th	Friday 24 th	Saturday 25 th
09:00			Opening ceremony + Plenary lecture	Plenary lecture	Plenary lecture	Congress Field Trip
09:30			Coffee break and Poster session	Parallel sessions	Parallel sessions	
09:40				Coffee break and Poster session	Parallel sessions	
10:40			Parallel sessions		Parallel sessions	
11:30			Lunch	Lunch	Lunch	
11:30						
13:00			Plenary Lecture	Plenary Lecture	Parallel sessions	
13:00		Hydrokarst course	Parallel sessions	Parallel sessions		
14:30		Hydrokarst course + Karma project meeting (15:00 - 18:30)			Round table	
15:00	Hydrokarst course					
15:10			Coffee break	Coffee break	Coffee break	
16:10			Parallel sessions	Parallel sessions	Closing and awards ceremony	
16:10			Parallel sessions	Parallel sessions	Parallel sessions	
16:45						
16:45			"Sharing with you my karst problem" (young-meeting) (18:00 - 20:00)	IAH-Karst Commission meeting	Gala dinner (20:30)	
18:00						
18:00			Dye-tracer group meeting			
19:00			Ice-breaker cocktail (19:00 - 21:30)			
Social Events						

PRE-CONGRESS EVENTS

HYDROKARST Course

Coordinators: Prof. Dr. Bartolomé Andreo Dr. Juan José Durán	June 20 th June 21 st	8:30 - 18:00 9:00 - 18:30	<i>Room B.1.1.</i>
Secretary: Dr. Matías Mudarra			

KARMA project meeting

Coordinator: Prof. Dr. Nico Goldscheider	June 21 st	15:00 - 18:30	<i>Room B.0.6.</i>
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Pre-congress Courses Venue

Ada Byron research building

Arquitecto Francisco Peñalosa, 18
29010 Málaga



TUESDAY 21ST

ADA BYRON RESEARCH BUILDING

8:30 - 18:30

Hydrokarst course

Room B.1.1.

It is highly recommended that participants in Eurokarst register on Tuesday to avoid long lines on Wednesday.

15:00 - 18:30

KARMA project meeting

Room B.0.6.

It is highly recommended that participants in Eurokarst register on Tuesday to avoid long lines on Wednesday.

BOTANIC GARDEN OF THE UNIVERSITY OF MALAGA

18:30

Early Registration

It is highly recommended that you register on Tuesday before the ice-breaker to avoid long lines on Wednesday.

EVENING SOCIAL

19:00 - 21:30

ICE-BREAKER COCKTAIL

[Botanic Garden of the University of Malaga](#) in front of the "Universidad" metro station

WEDNESDAY 22ND

9:00 - 10:30

Aula Magna

Plenary Session

9:00 - 10:00

Opening Ceremony

10:00 - 10:40

Opening Plenary Lecture

Chair: Jim LaMoreaux

The Land of Karst: A Visual Story

Speakers: *Zoran Stevanović*, Centre for Karst Hydrogeology at the Department of Hydrogeology of the University of Belgrade, Serbia

Neven Kresic, Geosyntec Consultants. Washington, D.C, USA

10:40 - 11:30	<p>Coffee break and poster session <i>Main Hall. Topic 1.</i></p> <p>Coffe Break courtesy of Valeport Water</p> 
11:30 - 13:00	<p>Parallel – Oral <i>Wednesday Morning. Aula Magna and Aula 9. Session 1A and 1B. Topic 1.</i></p>
13:00 - 14:30	<p>Lunch</p>
14:30 - 15:00	<p>Plenary Lecture Chairs: <i>Franci Gabrovšek and Jean-Baptiste Charlier</i> <i>Aula Magna</i></p> <p>Karst geomorphology and caves related to hydrogeology Speaker: <i>Nataša Ravbar, ZRC-SAZU Karst research institute</i></p>
15:10 - 16:10	<p>Parallel – Oral <i>Wednesday Afternoon. Aula Magna and Aula 9. Sessions 2A and 2B. Topics 1 and 2.</i></p>
16:10 - 16:45	<p>Coffee break <i>Main Hall</i></p>
16:45 - 18:00	<p>Parallel – Oral <i>Wednesday Afternoon. Aula Magna and Aula 9. Sessions 3A and 3B. Topic 2.</i></p>
18:00 - 20:00	<p>Meetings Dye-tracergroup meeting <i>Aula 9. Convener: Philippe Meus</i></p>
EVENING SOCIAL	
19:00 - 21:00	<p>YOUNG RESEARCHERS MEETING: Sharing with you my karst problem <i>Lunch area Convener: Mario Parise and Alejandro Carrasco</i></p>

THURSDAY 23RD

9:00 - 9:30	<p>Plenary Lecture Chairs: <i>Christelle Batiot and Phillippe Meus</i> <i>Aula Magna</i></p> <p>Karst Aquifer Resources availability and quality in the Mediterranean Area – challenges of the KARMA project Speaker: <i>Nico Goldscheider, Karlsruhe Institute of Technology (KIT)</i></p>
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9:30 - 10:40	Parallel – Oral <i>Thursday Morning. Aula Magna and Aula 9. Sessions 4A and 4B. Topic 2.</i>	
10:40 - 11:45	Coffee break and poster session <i>Main Hall. Topic 2.</i> Coffe Break courtesy of Van Walt	 VAN WALT monitoring your needs
11:45 - 13:00	Parallel – Oral <i>Thursday Morning. Aula Magna and Aula 9. Sessions 5A and 5B. Topic 2.</i>	
13:00 - 14:30	Lunch	
14:30 - 16:10	Plenary Sesion <i>Aula Magna</i> Plenary lecture 14:30 – 15:00 New trends on modelling on karst aquifers Speaker: Andreas Hartmann, <i>Technical University of Dresden</i> Round table Chair: Marco Petitta 15:00 – 16:10 Groundwater in karst aquifer: From research to sustainable management Participants: Nadine Göppert, Hervé Jourde, David Kreamer, Peter Malik and Brian Smith	Meeting <i>Aula 9</i> 15:00 – 16:10 Early career karst hydrologic modelers meeting <i>Convener: Daniel Bittner</i>
16:10 - 16:45	Coffee break <i>Main Hall</i>	
16:45 - 18:00	Parallel – Oral <i>Thursday Afternoon. Aula Magna and Aula 9. Sessions 6A and 6B. Topic 2.</i>	
18:00 - 19:00	IAH Karst Comission meeting <i>Sala de juntas</i>	
EVENING SOCIAL		
20:30	GALA DINNER: <i>Kaleido Málaga Port Restaurant – Palmeral de las Sorpresas, Port of Málaga</i>	

FRIDAY 24TH

9:00 - 9:30	<p>Plenary Lecture Chair: <i>Ronald Kozel and Philippe Renard</i> <i>Aula Magna</i></p> <p>Karst tales from the Middle East: a complexity of flow and transport Speaker: <i>Joanna Doummar, American University of Beirut</i></p>
9:40 - 10:40	<p>Parallel – Oral <i>Friday Morning. Aula Magna and Aula 9. Sessions 7A and 7B. Topic 3.</i></p>
10:40 - 11:30	<p>Coffee break and poster session <i>Main Hall. Topic 3.</i></p>
11:30 - 13:00	<p>Parallel – Oral <i>Friday Morning. Aula Magna and Aula 9. Sessions 8A and 8B. Topic 3.</i></p>
13:00 - 14:30	<p>Lunch</p>
14:30 - 16:00	<p>Parallel – Oral <i>Friday Afternoon. Aula Magna and Aula 9. Sessions 9A and 9B. Topic 3.</i></p>
16:00 - 16:45	<p>Coffee break <i>Aula Magna</i></p>
16:45 - 18:00	<p>Plenary Session: Closing and Awards Ceremony <i>Aula Magna</i></p>

SATURDAY 25TH

Field trip 1



Central sector of Málaga province: geomorphology and hydrogeology of carbonate and evaporitic karst massifs



Departure 8:00 / Return 19:00 approx.

Meeting point: by The City Hall of Málaga

Guides: Juan Antonio Barberá, Matías Mudarra and José Manuel Gil-Márquez

Field trip supported by



Field trip 2



Nerja Cave area - Eastern coast of Malaga province



Departure 8:00 / Return 19:00 approx.

Meeting point: by The City Hall of Málaga

Guides: Cristina Liñán Baena, Lucía Ojeda and Iñaki Vadillo

Field trip supported by



PARALLEL SESSIONS PROGRAMME

WEDNESDAY 22ND

Wednesday Morning 1A: Topic 1

Aula Magna (11:30-13:00)

Karst Geomorphology, Landscape and Cavities

Chairs: Peter Malik and Concepción Jiménez de Cisneros

11:30 Effects of seawater intrusion and sea level fluctuations on chemical reactions in coastal aquifers: Karst formation #17. *Maria Pool, Elena Abarca, Carlos Ayora, Marco Dentz.* **Speaker:** Maria Pool

11:45 Gypsum dissolution rate, new data and challenges #66. *Alice Buseti, Chiara Calligaris, Luca Zini.* **Speaker:** Alice Buseti

12:00 Evidences of past and present cave hypogenesis in the Serrezuela de Carratraca Massif (Málaga, Southern Spain) #149. *Juan José Durán-Valsero, Sergio Raúl Durán-Laforet, Pedro Agustín Robledo-Ardila, Raquel García-Morales.* **Speaker:** Sergio Raúl Durán-Laforet

12:15 Use of a free and open access high-resolution Digital Terrain Model for the identification of surface karst forms #18. *Bruce Ayache, Olivier Cabaret.* **Speaker:** Olivier Cabaret

12:30 Man and water in karst: when springs tell a very long history #28. *Mario Parise, Liso Isabella Serena.* **Speaker:** Mario Parise

12:45 Quaternary evolution of the the Caumont chalk caves (Seine valley, France) #90. *Daniel Ballesteros, Andrew Farrant, Carole Nehme, Diana Sahy, Kim Genuite, Ingrid Bejarano.* **Speaker:** Daniel Ballesteros

Wednesday Morning 1B: Topic 1

Aula 9 (11:30-13:00)

Karst Geomorphology, Landscape and Cavities

Chairs: Juan José Durán and Concepción Pla

11:30 Identification of near-surface karst cavities using the geostatistical posterior population expansion inverse method applied to electrical resistivity data #93. *Manon Trottet, Przemysław Juda, Arnulf Schiller, Philippe Renard.* **Speakers:** Manon Trottet, Philippe Renard

11:45 Hydrogeological setting of Las Loras UNESCO Global Geopark (Palencia-Burgos, Spain): State of knowledge and needs for water resources sustainability research #102. *Africa de la Hera Portillo, Julio López Gutiérrez, Karmah Salman, Daniel Ballesteros, Luis Moreno Merino, M^a Mar Corral Lledó, Ghanem Marwan, Alsharifa Hind, Badiia Chulli, Nour-Eddine Laftouhi, Fagr Kh. Abdel-Gawad, Elena Galindo Rodríguez, Miguel LLorente.* **Speaker:** Daniel Ballesteros

12:00 Ecohydrological characteristics of the Cerkniško Polje (Slovenia) as a result of flooding pattern changes and human activities #105. *Matej Blatnik, Franci Gabrovšek, Nataša Ravbar, Peter Frantar, Laurence W. Gill.* **Speaker:** Matej Blatnik

12:15 Airflow in karst vadose zone: patterns, drivers and consequences #122. *Franci Gabrovšek, Lovel Kukuljan, Vanessa Johnston.* **Speaker:** *Franci Gabrovšek*

12:30 Active biogeochemical role of cave sediments microbiota in CO₂ fluxes #81. *Tamara Martin-Pozas, Soledad Cuezva, Naomi Seijas, David Benavente, Juan Carlos Cañaveras, Sergio Sánchez-Moral, Angel Fernandez-Cortes.* **Speaker:** *Tamara Martin-Pozas*

Wednesday Afternoon 2A: Topic 1

Aula Magna (15:10-16:10)

Karst Geomorphology, Landscape and Cavities

Chairs: *Franci Gabrovšek and Jean-Baptiste Charlier*

15:10 Management of karst caves and springs in the Courel Mountains UNESCO Global Geopark (NW Spain) #103. *Daniel Ballesteros, África de la Hera, Miguel Llorente, Ramón Vila, M^a Mar Corral Lledó, Elena Galindo Rodríguez, Julio Lopez, Luis Moreno, Mónica Meléndez, Marwan Ghanem, A Hind, Badiaa Chulli, N E Laftouhi, F K Abdel-Gawad, Martín Alemparte.* **Speaker:** *Daniel Ballesteros*

15:25 Urban planning in karst regions of the Yucatan Peninsula, Mexico #132. *Oscar Frausto Martínez, Orlando Colin Olivares.* **Speaker:** *Oscar Frausto Martínez*

15:40 Use of terrestrial LiDAR scanner for monitoring of ice thickness in ice caves; examples from Slovenia #106. *Matej Blatnik, Jaroslav Obu, Jure Košutnik, Franci Gabrovšek.* **Speaker:** *Matej Blatnik*

15:55 Morphometric characterization of the coastal zone of the Caribbean Sea, Quintana Roo, México #140. *Francisco Rodríguez Castillo, Oscar Frausto Martínez, Wilbert David Uhu Yam, Orlando Colin Olivares.* **Presenter:** *Francisco Rodríguez Castillo*

Wednesday Afternoon 2B: Topic 2

Aula 9 (15:10-16:10)

Methods to Study Karst Aquifers

Chairs: *Attila Kovacs and Isabella Serena Liso*

15:10 Underground Karst River Monitoring Using Seismic Noise #8. *Anne Boetsch, Anthony Abi Nader, Benjamin Fores, Benjamin Pohl, Christian Sue, Clément Hibert, Hélène Celle, Jean-Philippe Malet, Julie Albaric, Marc Steinmann, Vanessa Stefani.* **Speaker:** *Anthony Abi Nader*

15:25 Study of the Orbieu watershed with a strong karstic component: contribution of new data for better flood forecasting #168. *Laurent Hermand, Fabien Levard, Christophe Subias, Helene Mathieu-Subias.* **Speaker:** *Fabien Levard*

15:40 Deriving major ion concentrations at high resolution from continuous electrical conductivity measurements in karst systems #19. *Beatrice Richieri, Daniel Bittner, Andreas Hartmann, Paolo Benettin, Boris M. van Breukelen, David Labat, Gabriele Chiogna.* **Speaker:** *Beatrice Richieri*

15:55 Validation of the SCA routine with multiple satellite images, and ground observations in the mountainous karst catchment, Hochschwab, Austria #15. *Süleyman Selim Çallı, Juraj Parajka, Juergen Komma.* **Speaker:** *Süleyman Selim Çallı*

Wednesday Afternoon 3A: Topic 2

Aula Magna (16:45-18:00)

Methods to Study Karst Aquifers

Chairs: Daniel Bittner and Nadine Göppert

16:45 New insights into water-quality dynamics using a novel paired-catchment approach inside a karst and cave system in Southern Germany #53. Yanina Müller, Nadine Goepfert, Nico Goldscheider. **Speaker:** Yanina Müller

17:00 pyKasso: a stochastic karst network generator #38. François Miville, Chloé Fandel, Philippe Renard **Speaker:** François Miville

17:15 Distribution of karst conduit size from quarries (Apricena quarry district, southern Italy) #34. Alberto Riva, Marco Filipponi Marcello Caggiati, Valentina Mascina, Michele Morsilli. **Speaker:** Alberto Riva

17:30 Estimation of Inflow from Karstic Conduits: a stochastic discrete–continuum modeling approach #26. Valentin DallAlba, Alexis Neven, Rob de Rooij, Philippe Renard, Marco Filipponi. **Speakers:** Valentin DallAlba, Alexis Neven

17:45 Characterization of the isotopic signature of effective rainfall ($\delta^{18}\text{O}$, $\delta^2\text{H}$) to constrain the groundwater recharge zones in a Mediterranean karst aquifer #55. Thibaut Garin, Bruno Arfib, Bernard Ladouche, Benoit Dewandel, Julio Goncalves. **Speaker:** Thibaut Garin, Bruno Arfib

Wednesday Afternoon 3B: Topic 2

Aula 9 (16:45-18:00)

Methods to Study Karst Aquifers

Chairs: Daniel Ballesteros and Charles Danquigny

16:45 Transit Time index (TTi) as an adaptation of humification index to illustrate hydrodynamic and transit time differences of karst springs. Application to the karst springs of Fontaine de Vaucluse system #51. Leïla Serène, Christelle Batiot-Guilhe, Christophe Emblanch, Naomi Mazzilli, Milanka Babic, Julien Dupont, Roland Simler, Matthieu Blanc, Gérard Massonnat. **Speaker:** Leïla Serène

17:00 Application of statistical approaches to piezometry to improve the understanding of the karst aquifer hydrodynamic behavior at the Cadarache CEA center (France) #40. Manon Erguy, Sébastien Morilhat, Guillaume Artigue, Julien Trincal, Anne Johannet, Séverin Pistre. **Speaker:** Manon Erguy

17:15 A combined stochastic-analytical approach to forecasting climate change impact on spring discharge #41. Attila Kovacs, Zoran Stevanovic. **Speaker:** Attila Kovacs

17:30 Multiple Time Series Regression and Transfer Function Noise Modeling, Two Data-Driven Time Series Analysis Approaches for Karst Hydrological Simulation #134. Max Gustav Rudolph, Alireza Kavousi, Thomas Reimann, Raoul Collenteur, Markus Giese, Torsten Noffz, Pierre-Yves Jeannin, Steffen Birk, Thomas Wöhling, Mohammad Reza Mahmoudi, Andreas Hartmann. **Speakers:** Max Gustav Rudolph, Alireza Kavousi, Thomas Reimann

17:45 Modelling groundwater storage and discharge in a high-elevated geologically complex catchment – Dolomites, Alps #170. Zhao Chen, Andreas Hartmann, Giorgia Lucianetti. **Speakers:** Zhao Chen

THURSDAY 23RD

Thursday Morning 4A: Topic 2

Aula Magna (09:40-10:40)

Methods to Study Karst Aquifers

Chairs: *Christelle Batiot and Phillipe Meus*

09:40 Understandig karst conduit size distribution by numerical speleogenesis modeling #56. *Axayacatl Maqueda, Marco Filipponi, Philippe Renard.* **Speaker:** *Axayacatl Maqueda*

09:55 Improvement of the Arcier karstic hydrosystem modelling, by using of hydrochemistry data (France) - TRANSKARST Project. #59. *Victor Klabá, H  l  ne Celle, Flavien Choulet, Pierre Trap, Julie Albaric, Matthieu Fournier, Fr  d  ric Huneau, Xavier Bertrand, Nadia Crini, Christophe Loup.* **Speaker:** *Victor Klabá*

10:10 Definition of new indicators for the characterization and classification of karst aquifers using discharge time series #62. *Vivien Hakoun, Jean Christophe Marechal, Bernard Ladouche, Jean-Baptiste Charlier, Vincent Bailly-Comte* **Speaker:** *Jean Christophe Marechal*

10:25 Large-scale spatial reconstitution of pressure and tracer tests responses in a karst aquifer (Lez aquifer, France) #65. *Herv   Jourde, Pierre Fischer, V  ronique Leonardi* **Speaker:** *Pierre Fischer*

Thursday Morning 4B: Topic 2

Aula 9 (09:40-10:40)

Methods to Study Karst Aquifers

Chair: *Petar Milanovi   and Thomas Reimann*

09:40 Saltwater intrusion and flow reversal at the submarine spring of a Mediterranean karst aquifer: observation, interpretation and modelling #33. *Jean Christophe Marechal, Bernard Ladouche, Claudine Lamotte, Benoit Dewandel, Vivien Hakoun, Pierre Perrochet.* **Speaker:** *Jean Christophe Marechal*

09:55 Monitoring the water stock in karst vadose zone using two vertically distributed superconducting gravimeters help to quantify evapotranspiration at daily time scale #63. *Albert Olioso, Bertille Loiseau, Chlo   Ollivier, C  dric Champollion, Damien Jougnot, Jacques Hinderer, Nicolas Martin-StPaul, Nolwenn Lesparre, Simon Carri  re.* **Speaker:** *Bertille Loiseau*

10:10 Hydrogeological response and classification of karst aquifers from the analysis of Rainfall-Discharge-Electrical conductivity relationships #64. *Jean-Baptiste Charlier, Antonin Puget, Bruno Arfib, Vincent Bailly-Compte, Fran St  phane Binet, Vivien Hakoun, Herv   Jourde, Bernard Ladouche, Jean Christophe Marechal.* **Speaker:** *Jean-Baptiste Charlier*

10:25 Electrical Resistivity Tomography (ERT) Applied to Karst Carbonate Aquifers: Case Study from Zaghouan-Ben Saidan (NE Tunisia) #58. *Amal Mhimdi* **Speaker:** *Amal Mhimdi*

Thursday Morning 5A: Topic 2

Aula Magna (11:45-13:00)

Methods to Study Karst Aquifers

Chairs: *Mario Parise and Nataša Ravbar*

11:45 Deployment of water quality sensors within an artesian well #166. *Gimena Rodriguez, Vincent van Walt.*
Speakers: *Gimena Rodriguez, Vincent van Walt*

12:00 The paradox of karstic peatlands: a combined hydrological and geochemical study in the Frasne peatland, French Jura Mountains #97. *Alexandre Lhosmot, Julien Bouchez, Marc Steinmann, Véronique Lavastre, Vanessa Stefani, Anne Boetsch, Philippe Binet, Marie-Laure Toussaint, Thierry Winiarski, Frédéric Paron, Jérôme Gaillardet, Guillaume Bertrand, Christophe Loup.* **Speaker:** *Alexandre Lhosmot*

12:15 What microbial signature means in terms of groundwater dynamics, vulnerability and residence time – Comparison of shallow and deep karst resources #114. *Michael Sinreich, Alain Pochon.* **Speaker:** *Michael Sinreich*

12:30 Modelling Air Pressure inside Barometric Caves: A Case Study from Wind Cave and Jewel Cave (South Dakota) #85. *Annika K. Gomell, Andreas Pflitsch.* **Speaker:** *Annika K. Gomell*

12:45 Tracer tests to infer the impacts of surface streams on nearby springs in fissured-karst aquifers #91. *Philippe Meus.* **Speaker:** *Philippe Meus*

Thursday Morning 5B: Topic 2

Aula 9 (11:45-13:00)

Methods to Study Karst Aquifers

Chairs: *Vincent Bailly-Comte and Daniel Bittner*

11:45 From sedimentation to speleogenesis. An integrated process-based workflow for modeling a karst reservoir. #113. *Gérard Massonnat, Charles Danquigny, Emmanuelle Leonforte, Mickaël Barbier, Lucie Dal Soglio, Jean-Louis Lesueur.* **Speakers:** *Gérard Massonnat*

12:00 Representing karst processes in regional groundwater models #109. *Yan Liu, Thorsten Wagener, Andreas Hartmann.* **Speaker:** *Yan Liu*

12:15 Standalone submersible fluorometer for dye tracing in challenging environments #121. *Amaël Poulain, Geert De Sadelaer, Romain Deleu, Gaëtan Rochez, Vincent Hallet.* **Speaker:** *Amaël Poulain*

12:30 Assessment of land cover change impact on water quality of a Pyrenean karstic catchment (Baget, France) since the middle of the 20th century #100. *Francesco Ulloa-Cedamano, Jean Luc Probst, Claire Marais-Sicre, Eva Vrech, Eric Maire, Anne Probst.* **Speaker:** *Francesco Ulloa-Cedamano*

12:45 Inversion of synthetic Electrical Resistivity Tomography experiments for the characterization of fractured rocks #73. *Cédric Champollion, Delphine Roubinet.* **Speaker:** *Cédric Champollion*

Thursday Afternoon 6A: Topic 2

Aula Magna (16:45-18:00)

Methods to Study Karst Aquifers

Chairs: Laurence Gill and Jean Christophe Marechal

16:45 Instabilities in the early development of karst systems #123. Franci Gabrovsek, Wolfgang Dreybrodt. **Speaker:** Franci Gabrovsek

17:00 CFpy – A Python Package for Generation, Pre- and Post-Processing of Conduit Networks and Simulation Results for the Conduit Flow Process (CFP) of MODFLOW Models #135. Thomas Reimann, Max Gustav Rudolph, Torsten Noffz, Alireza Kavousi, Steffen Birk. **Speakers:** Thomas Reimann, Max Gustav Rudolph

17:15 Quantifying microplastic debris sourcing and transport through a cave system #169. Teresa Baraza, Elizabeth A. Hasenmueller. **Speaker:** Teresa Baraza

17:30 On the choice of performance metric for model calibration scheme using discharge age-information #125. Kübra Özdemir Çalli, Andreas Hartmann, Daniel Bittner. **Speaker:** Kübra Özdemir Çalli

17:45 A new approach to assess karst groundwater recharge tested at six sites across the globe #128. Romane Berthelin, Michael Rinderer, Matías Mudarra, Tunde Olarinoye, Dominic Demand, Andreas Hartmann. **Speaker:** Romane Berthelin

Thursday Afternoon 6B: Topic 2

Aula 9 (16:45-18:00)

Methods to Study Karst Aquifers

Chairs: Franceso Fiorillo and Anne Johannet

16:45 Implications of Tryptophan-Like-Fluorescence long term monitoring for bacterial detection in a mountainous rural karst aquifer #141. Jaime Fernández-Ortega, Bartolomé Andreo Navarro, Juan Antonio Barberá Fornell. **Speaker:** Jaime Fernández-Ortega

17:00 Tools and indicators for monitoring karst water quality (the Unica springs, SW Slovenia) #98. Nataša Ravbar, Metka Petrič, Janez Mulec, Cyril Mayaud, Matej Blatnik, Blaž Kogovšek. **Speaker:** Nataša Ravbar

17:15 Evaluating theoretical conduit configurations in the Yucatan karst with MODFLOW-CFP #138. Miguel Moreno Gómez, Alireza Kavousi, Carolina Martínez Salvador, Thomas Reimann. **Speakers:** Miguel Moreno Gómez, Alireza Kavousi, Thomas Reimann

17:30 A new automated estimation method for master recession parameters and uncertainty quantification #137. Tunde Olarinoye, Michael Rinderer, Tom Gleeson, Andreas Hartmann **Speaker:** Tunde Olarinoye

FRIDAY 24th

Friday Morning 7A: Topic 3

Aula Magna (09:40-10:40)

Karst Hydrogeology

Chairs: Ronald Kozel and Phillipe Renard

09:40 Hydrogeological characterization and modeling at two test sites of the Apulian karst (Southern Italy) #16. *Isabella Serena Liso, Claudia Cherubini, Mario Parise. Speaker: Isabella Serena Liso*

09:55 Nitrate dynamics in karst aquifers: a synthesis of 6 years of high-frequency monitoring in the French Jura Mountains #14. *Marc Steinmann, Christophe Loup, Vanessa Stefani, Anne Boetsch. Speaker: Marc Steinmann*

10:10 Updating the water budget of the Gran Sasso carbonate fractured/karstified aquifer (Central Italy) for a sustainable management of groundwater resources #129. *Valeria Lorenzi, Chiara Sbarbati, Francesca Banzato, Mauro Manetta, Marco Petitta. Speaker: Marco Petitta*

10:25 Mixing and dynamics of autogenic and allogenic waters in a large karst aquifer (Causse du Quercy, France) #25. *David Viennet, Guillaume Lorette, Pierre Crançon, David Labat, Matthieu Fournier, Mathieu Sebilo. Speaker: David Viennet*

Friday Morning 7B: Topic 3

Aula 9 (09:55-10:40)

Karst Hydrogeology

Chairs: Juan Antonio Barberá and Beatriz de la Torre

09:55 Quantifying the response of karst discharge to long-term climate variations at Blautopf spring #29. *Xinyang Fan, Nico Goldscheider, Nadine Göppert. Speaker: Xinyang Fan*

10:10 Structural and hydraulic properties of fractured carbonate karst aquifers of Umbria-Marche Apennines (Central Italy) #31. *Andrea Tamburini, Marco Menichetti. Speaker: Marco Menichetti*

10:25 Shift of dissolved inorganic carbon and aquatic photosynthesis sequestration in Lijiang River, Guilin #10. *Cheng Zhang, Qiong Xiao. Speaker: Cheng Zhang*

Friday Morning 8A: Topic 3

Aula Magna (11:30-13:00)

Karst Hydrogeology

Chairs: Zhao Chen and Chloé Fandel

11:30 Climatic influence on the hydrochemical characteristics of karst springs. The case of Andalusia (southern Spain) #44. *Francisco Moral Martos, José Luis Yanes Conde. Speaker: Francisco Moral Martos*

11:45 A karstogenetic model to understand the karstic functioning of the Causse Méjean, France #45. *Vincent Bailly-Comte, Elisabeth Legoff, Hubert Camus, Coline Ariagno, Yannick Manche, Claudine Lamotte. Speaker: Vincent Bailly-Comte*

12:00 Development of a consistent Mediterranean karst aquifer map and database (MEDKAM) and advanced analyses of karst groundwater resources #50. *Julian Xanke, Nico Goldscheider.* **Speakers:** Julian Xanke, Nico Goldscheider

12:15 A new methodology for safe tracing to public water supply abstractions in the Chalk #36. *Daniel Matthews, Jared West, Simon Bottrell, Louise Maurice, Andrew Farrant.* **Speaker:** Daniel Matthews

12:30 Initiative to select, label and protect the world's most important karst springs #42. *Zoran Stevanovic.* **Speaker:** Zoran Stevanovic

12:45 A methodology to assess the sensitivity of karst groundwater resources to climate change and anthropogenic pressures. #47. *Vianney Sivel, Hervé Jourde, Guillaume Cinkus, Yohann Cousquer, David Labat, Naomi Mazzilli, Chloé Ollivier, Yves Trambly.* **Speaker:** Vianney Sivel

Friday Morning 8B: Topic 3

Aula 9 (11:30-13:00)

Karst Hydrogeology

Chairs: Michael Sinreich and Marc Steinmann

11:30 Flood hazard in the Classical Karst: the case of Mucille polje (NE Italy) #83. *Philippe Turpaud, Chiara Calligaris, Luca Zini.* **Speaker:** Luca Zini

11:45 Testing the validity of different synthetic scenarios for flow and transport simulation in karst systems using a real case study application. #79. *Jihad Othman, Joanna Doummar, Marwan Fahs, Benjamin Belford, Thomas Graf.* **Speaker:** Joanna Doummar

12:00 Impacts of Recharge and Discharge on Sustainability of the Trinity Aquifers of Central Texas #84. *Brian Smith, Brian Hunt, Jeff Watson, Justin Camp.* **Speaker:** Brian Smith

12:15 Karst aquifer hydrological stages, crustal displacements and earthquakes in southern Italy #57. *Guido Leone, Nicola D'Agostino, Raffaella De Matteis, Guido Adinolfi, Francesca Silverii, Libera Esposito, Francesco Fiorillo.* **Speaker:** Guido Leone

12:30 Climate Change Impact on Big Spring Storage Capacity Using Spectral Analysis and Wavelets #87. *Farid Achour, Michel Bakalowicz.* **Speaker:** Farid Achour

Friday Afternoon 9A: Topic 3

Aula Magna (14:30-16:00)

Karst Hydrogeology

Chairs: Chiara Calligaris and Brian Smith

14:30 Prediction of future interactions between karst and river regarding to climate change based on IPCC scenarios: application to a Mediterranean french river basin (Cèze) #95. *Yvan Pascoletti, Hervé Chapuis, Frédéric Paran, Joel Jolivet, Erik Van Der Broeck, Didier Graillet.* **Speaker:** Yvan Pascoletti

14:45 Monitoring of pesticides occurrence and dynamics in karst groundwater #94. *Johannes Schorr, Franziska Jud, Stephanie Zimmermann, Michael Sinreich, Heinz Singer, Philipp Longree, Birgit Beck, Juliane Hollender.* **Speakers:** Stephanie Zimmermann, Ronald Kozel

15:00 Unravelling the interrelationships between hydro(geo)ology and ecology in calcareous fen wetlands supported by karst aquifers #101. Laurence Gill, Ella Bijkerk, Shane Regan, Paul Johnston, Stephen Waldren, Catherine Coxon. **Speaker:** Laurence Gill

15:15 Statistical evaluation and ANN modelling of the discharge spring response for Djebel Zaghouan karstic aquifer #49. Emna Gargouri-Ellouze, Tegawende Arnaud Ouedraogo, Fairouz Slama, Rachida Bouhlila. **Speaker:** Fairouz Slama

15:30 Hydrodynamic characterization of sources of karst: case of the source of Ain Sebou (middle Atlas, central, Morocco) #96. Abdelghani Qadem, Sébastien Lebaut, Zohair Qadem. **Speaker:** Abdelghani Qadem

15:45 The hydrogeological behavior of springs in face of rainfall fluctuations in the plain of Fez and its middle Atlas border #99. Zohair Qadem, Abdelghani Qadem, Mohamed Lasri, Ferdaouss Lakhili, Khalid Obda, Abderrahim Ettaqy. **Speakers:** Zohair Qadem, Abdelghani Qadem

Friday Afternoon 9B: Topic 3

Aula 9 (14:30-16:00)

Karst Hydrogeology

Chairs: Joanna Doummar and Matías Mudarra

14:30 Update of the Swiss approach for groundwater protection zoning in karst areas #117. Alain Pochon, Michael Sinreich. **Speaker:** Michael Sinreich

14:45 Water quality and vulnerability assessment of small karst springs. A case study from Northern Norway #124. Rannveig Skoglund, Christos Pennos, Stein-Erik Lauritzen. **Speakers:** Rannveig Skoglund

15:00 Characterization of hydrogeological processes of karst-influenced multi-layered aquifers of basin edge using statistical and geochemical approaches (northern Aquitaine basin, France) #116. Marianella Quispe Sihuas, Jean-Baptiste Charlier, Roland Lastennet, Benoit Dewandel, Olivier Cabaret, Alain Denis. **Speaker:** Marianella Quispe Sihuas

15:15 Tracer dispersion in karstic environments: quantification and characterization by multi-point tracer tests #133. Romain Deleu, Amaël Poulain, Gaëtan Rochez, Vincent Hallet. **Speaker:** Romain Deleu

15:30 Surprising time lag between precipitation and groundwater levels in a karst aquifer of Kopa Mt. (Slovakia) #119. Peter Malík, Marián Coplák, Švasta Jaromír, Bajtoš Peter, Černák Radovan. **Speakers:** Peter Malík, Černák Radovan

POSTER SESSIONS PROGRAMME

WEDNESDAY 22ND

Main Hall (10:40-11:30)

Poster title #Contribution ID. Authors. Presenter.

TOPIC 1 Karst Geomorphology, Landscape and Cavities

Soil thickness characterization in a humid tropical karst area in the southeastern of Brazil #21. Rogério Tadeu de Souza, Andréia Bicalho Henriques, João Hebert Moreira Viana. **Presenter:** Rogério Tadeu de Souza

Morphometric comparison of dolines in three karst landscapes developed on different lithologies #162. Eulogio Pardo-Igúzquiza, Jose Manuel Gil-Márquez, Matías Mudarra, Juan Jose Durán Valseo, Bartolomé Andreo Navarro. **Presenter:** Jose Manuel Gil-Márquez, Matías Mudarra.

Understanding morphosedimentary changes and extreme past floods: the case of Ojo de Valjunquera cave (Iberian Range, Spain) #75. Guillermo Perez Villar, Miguel Bartolomé, Gerardo Benito, Alicia Medialdea, Marc Luetscher, Edwards R. L., Ana Moreno. **Presenter:** Guillermo Perez Villar

Microstratigraphic analysis of a speleothem from the Nerja Cave (Málaga, Southern Spain) #167. Concepción Jiménez de Cisneros, Antonio González-Ramón, Cristina Liñán-Baena, Gabriela Loncomilla. **Presenter:** Concepción Jiménez de Cisneros

Hydrological and environmental dynamics in the Güixas show cave: tourist exploitation and flood risk management #74. Reyes Giménez, Miguel Bartolomé, Lope Ezquerro, Gerardo Benito, Marc Luetscher, Ana Moreno. **Presenter:** Reyes Giménez

Investigation of the characteristics of Gachsaran Formation and their role in the formation of sinkholes #157. Hamide Gholamheidari, Mojgan Entezari, Haji Karimi. **Presenter:** Hamide Gholamheidari

Unroofed cave – an underground form on the karst surface #9. Martin Knez, Tadej Slabe. **Presenters:** Martin Knez, Tadej Slabe

A new and simple proposal of karst architectural types and their geomorphological and hydrogeological implications: wardrobe-type karst and bed-type karst #150. Eulogio Pardo-Igúzquiza, Juan José Durán-Valseo, Pedro Agustín Robledo-Ardila, Raquel Morales-García, Sergio Raúl Durán-Laforet. **Presenter:** Juan José Durán-Valseo

Subsphere: an approach to the proposal for a new environmental system in the Planet #152. Pedro Robledo, Juan José Durán Valseo, Eulogio Pardo Igúzquiza, Raquel Morales García, Rebeca Álvarez Alonso, Sergio Durán Laforet. **Presenter:** Pedro Robledo

Geophysical researches to detect karst caves in the main polje of Apulia #30. Michele De Girolamo, Romano Gerardo, Mario Parise. **Presenter:** Romano Gerardo

Study of Rull Cave dynamics to understand the complex relationships between soil, cave and external atmosphere #43. Concepción Pla, Sara Gil-Oncina, María Candela Ruiz, Juan Carlos Cañaveras, Soledad Cuezva, Ángel Fernández-Cortés, Sergio Sánchez-Moral, David Benavente. **Presenter:** Concepción Pla

Celebration of events in karstic caves? Highlighting the need for environmental studies before deciding #54. Cristina Liñán Baena, Luis-Efrén Fernández Rodríguez, Yolanda Del Rosal Padial. **Presenters:** Cristina Liñán Baena, Yolanda Del Rosal Padial

Cave of Jebel Stah: “The ante-prehistoric cave” (SW of Jebel Zaghouan) #82. *Ines Ezzine, Amal Mhimdi. Presenter: Ines Ezzine, Amal Mhimdi*

Multidisciplinary investigation of karstic subsidence in a Madrid urbanization #148. *Eugenio Sanz Perez, Cesar Sanz Riaguas, Joaquín Sanz de Ojeda. Presenter: Eugenio Sanz Perez*

The importance of snow in the hydrogeology of a high relief karst system: Sierra de Tendeñera, in the Pyrenees Mountain range (Huesca, Northern Spain) #154. *Juan José Durán-Valsero, Eulogio Pardo-Igúzquiza, Raquel Morales-García, Juan Antonio Luque-Espinar, Sergio Raúl Durán-Laforet, David Balard, Idefonso Quiroga, Jordi Borrás, Jaime Ferreres. Presenter: Juan José Durán-Valsero*

UNESCO Global Geopark Famenne-Ardenne, Belgium: an exceptional landscape shaped in a contrasted limestone – shale deposit environment #161. *Vincent Hallet, Sabine Blockmans, Serge Delaby, Sophie Verheyden, Yves Quinif. Presenter: Vincent Hallet*

THURSDAY 23RD

Main Hall (10:40-11:30)

Poster title #Contribution ID. Authors. Presenter.

TOPIC 2 Methods to Study Karst Aquifers

Tectonic control on karst aquifers behavior inferred from multi-tracer test results: an example from the Betic Cordillera #126. *Beatriz de la Torre Martínez, Juan Antonio Barberá Fornell, Matías Mudarra, Bartolomé Andreo Navarro. Presenter: Beatriz de la Torre Martínez*

Field fluorometer with spectrometric capability #12. *Pierre-Andre Schnegg. Presenter: Pierre-Andre Schnegg*

Combining quantitative analysis tools (cross-correlation analysis and dye tracer tests) to assess response times in karst aquifers. The Ubrique karst system (southern Spain) #142. *José Francisco Martín Rodríguez, Matías Mudarra, Bartolomé Andreo Navarro. Presenter: José Francisco Martín Rodríguez*

Long term monitoring of a Mediterranean karst system used for water supply. Implication for the characterization and modelling of its dynamics. Case of the Lez karst system (MEDYCYSS Observatory) #61. *Christelle Batiot-Guilhe, Aubin Allies, Guillaume Artigue, Pierre-Alain Ayral, Vincent Bailly-Comte, Hélène Barral, Pascal Brunet, Léa Causse, Cinkus Guillaume, Yohann Cousquer, Nanée Chahinian, Sophie Delpoux, Véronique de Montety, Jérôme Demarty, Angélique Desoeuvre, Alain Dezetter, Jordi Etchanchu, Juliette Fabre, Pierre Fischer, Maurice Guillod, Vincent Guinot, Marina Hery, Anne Johannet, Hervé Jourde, Bernard Ladouche, Léonardi Véronique, Patricia Licznar-Fajardo, Olivier Lobry, Ibrahim Mainassara, Pierre Marchand, Marie Mylène, Lucie Martin, Rémi Muller, Monique Oï, Nicolas Patris, Laïna Pérotin, Séverin Pistre, Nathalie Rouché, Marine Rousseau, Jean-Luc Seidel, Vianney Sivelle, Jean-Denis Taupin, Francesco Ulloa-Cedamano, Marc Vinches, Chaoqi Wang, Leila Serene. Presenter: Christelle Batiot-Guilhe*

Influence of local karst conduits morphology on tracer tests breakthrough curves (Fontaine de Nîmes, France) #67. *Hervé Jourde, Pierre Fischer, Vincent Bailly-Comte. Presenter: Pierre Fischer*

Oil pollution of karst aquifers, a case study of Zagros Mountains, Iran #11. *Hossein Karimi Vardanjani, Derek Ford. Presenter: Hossein Karimi Vardanjani*

Detection of dolines using remote sensing and GIS and recharge assessment based on APPLIS method: case of Djebel Zaghouan karst aquifer #115. *Hedia Chakroun, Fairouz Slama, Rihab Nabli, Wafa Saidi, Rachida Bouhlila. Presenters: Hedia Chakroun, Fairouz Slama*

KarstID: An interactive R application for karst spring hydrograph analysis that also provides a classification of karst hydrological functioning #24. *Guillaume Cinkus, Naomi Mazzilli, Hervé Jourde.* **Presenter:** *Guillaume Cinkus*

Groundwater chemistry characterization and clustering based on Principal Component Analysis (PCA) #72. *Hervé Chapuis, Steve Peuble, Frédéric Paran, Frédéric Gallice, Didier Graillot, Joël Jolivet, Erik Van Den Broeck, Véronique Lavastre.* **Presenters:** *Hervé Chapuis, Steve Peuble*

Rainfall-discharge modelling of the Djebel Zaghouan aquifer using KarstMod #86. *Fairouz Slama, Emna Gargouri-Ellouze, Tayssir Faydi, Guillaume Cinkus, Hervé Jourde, Rachida Bouhlila.* **Presenter:** *Fairouz Slama*

Using trace metals and turbidity to characterize the relative influence of allogenic recharge in a binary karst system in southern Spain #143. *Jaime Fernández Ortega, Bartolomé Andreo Navarro, Juan Antonio Barberá Fornell.* **Presenter:** *Jaime Fernández Ortega*

Coupling numerical approaches for a deeper assessment of karst groundwater vulnerability #48. *Vianney Sivelle, Hervé Jourde, Pierre Fischer, Yohann Cousquer, Mohammed Aliouache, Guillaume Artigue, Guillaume Cinkus, Jérôme Demarty, Alain Dezetter, Jordi Etchanchu, Vincent Guinot, Anne Johannet, Véronique Léonardi, Samer Majdalani, Laïna Pérotin, Séverin Pistre, Yves Trambly, Marc Vinches, Chaoqi Wang.* **Presenter:** *Vianney Sivelle*

Identification of the origin and type of flow in a karst under cover (Barrois limestone; Meuse): contribution of hydrochemical and geophysical coupling #146. *Mathieu Bertrand, Sophie Denimal, Naomi Mazzilli, Rémi Valois, Sylvain Gignoux, Lise-Marie Girod, Konstantinos Chalikakis, Catherine Bertrand.* **Presenter:** *Mathieu Bertrand*

Numerical flow simulations in overexploited carbonate aquifers. An example from South of Spain #159. *Carlos Marín-Lechado, Carolina Guardiola-Albert, Jineth Castañeda-Quijano, Nuria Naranjo Fernández, Matías Mudarra-Martínez, Sergio Martos-Rosillo.* **Presenter:** *Nuria Naranjo Fernández*

FRIDAY 24TH

Main Hall (10:40-11:30)

Poster title #Contribution ID. Authors. Presenter.

TOPIC 3 Karst Hydrogeology

Spatial modeling of flash flooding in a small karst basin: Example of St Pierre-la-Vacquerie (Causse du Larzac, France) #22. *Pierre Fischer, Séverin Pistre.* **Presenters:** *Pierre Fischer, Séverin Pistre*

Hydrochemical and isotopic characterization from some springs in a mountain hydrokarst, Youkous region, NE of Algeria #39. *Iklass Hamaili, Chemseddine Fehdi, Fethi Baali.* **Presenter:** *Iklass Hamaili.*

Understanding water table fluctuations in a karstic semiarid Mediterranean aquifer through numerical modelling: the case of Almudaina-Segaria aquifer #76. *María Candela Ruiz, Concepción Pla, Javier Valdés-Abellán, Miguel Fernández-Mejuto, Juan Antonio Hernández-Bravo, David Benavente.* **Presenter:** *María Candela Ruiz*

Identification of fast preferential flow distribution in a complex snow-governed karst system based on an inference of secondary faults, doline distribution, and tracer tests experiments: An application to Mount Lebanon #80. *Joanna Doummar, Ariel Almendral Vazquez.* **Presenter:** *Joanna Doummar*

Hydrologic Characterization via Classified Flow of the karstic spring of Ain Zerga Tebessa, North East of ALGERIA #23. *Bilel Djoulah, Mohamed Laid Hemila.* **Presenter:** *Bilel Djoulah*

Vulnerability and risk of aquifer's contamination in the east of Tebessa plain (Bekkaria) - Algeria - #35. *Radhia Legrioui, Ilhem Abdeslam, Amor Hamad, Toufik Djebassi, Fethi Baali, Chamseddine Fehi.* **Presenter:** *Radhia Legrioui, Ilhem Abdeslam, Fethi Baali, Chamseddine Fehdi*

Recession processes in Red Lake, Imotski #37. *Adrijana Vrsalović, Ivo Andrić, Ognjen Bonacci.* **Presenter:** *Adrijana Vrsalović*

Intrinsic Vulnerability to Contamination of Karst Aquifers in South America and the Caribbean: facing challenges #32. *Rogério Tadeu de Souza, Yameli G. Aguilar Duarte, Francisco Bautista, Olga Susana Heredia, Silvia Alejandra Sicilia, Mariana Alicia Paparas, Franco Urbani Patat, Rosa María Valcarce Ortega, Moraima Fernández Rodríguez, Liane Gamboa Corrales, Nathalia Vanessa Uasapud Enríquez, Luiz Eduardo Panisset Travassos.* **Presenter:** *Rogério Tadeu de Souza*

Long discharge time series of karst springs and relationships with climate: analysis of the climate change effect on the groundwater systems #60. *Guido Leone, Vittorio Catani, Libera Esposito, Mauro Pagnozzi, Gerardo Ventafridda, Gianni Testa, Francesco Fiorillo.* **Presenter:** *Guido Leone, Francesco Fiorillo*

Hydrodynamic behavior and saline-thermal variability of “cenotes” in the Yucatan Peninsula (Mexico) #107. *Angela Vallejos, Fernando Sola, Malva A. Mancuso.* **Presenter:** *Fernando Sola*

Geological characteristics of karsts in Jebel Zaghuan (NE of Tunisia – North Africa) #108. *Mohamed Ghanmi, Amal Mhimdi, Ines Ezzine, Fadoua Hamzaoui, Rachida Bouhlila.* **Presenter:** *Mohamed Ghanmi*

Pollution vulnerability index of the coastal karst aquifer of a coastal area of the Mexican Caribbean #139. *Wilbert David Uhu Yam, Oscar Frausto Martínez, José Francisco Rodríguez Castillo, Orlando Colín Olivares.* **Presenter:** *Wilbert David Uhu Yam*

Hydrochemical and isotopic tools, the keys to water resource management (case of a karst reservoir from Morocco) #156. *Abdellatif Rafik, Mohammed Bahir, Abdelaziz Beljadid, Abdelghani Chehbouni, Driss Dhiba.* **Presenter:** *Abdellatif Rafik*

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