



# MIA Specialist Group

Open Group meeting at Watermatex2023

**Dr Ulf Jeppsson**

Chair of MIA SG, Lund University, Sweden



**LUND**  
UNIVERSITY



**inspiring change**

# AGENDA



- Introduction
- Group organization and composition
- Activities
  - Task Groups and Working Groups
  - Webinars
  - Conferences
  - Others
- Call for new MC members
- Introducing new chair and vice-chair

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# MIA SPECIALIST GROUP



*“This group targets people from research, consulting companies, institutions and operators to think along **the use of models and computing tools to support the understanding, management and optimization of water systems.**”*

## How to find us



Website: <http://iwa-mia.org/>



<https://iwa-connectplus.org>

## PRIORITIES

- Stimulate interaction and knowledge transfer in the domain of modelling and integrated assessment
- Interact with other IWA SGs and other academic/professional organisations

## GENERAL ACTIVITIES OF MIA MC



- Spread information of the Group's activities and developments
- Convene conferences and arrange workshops/webinars
- Initiate research and case studies, produce special papers
- Stimulate initiation and host Task Groups and Working Groups
- Interact and streamline activities with other IWA SGs, as well as with other academic and professional organisations
- Start SG-internal committees on specific emerging topics of interest
- Work for the benefit of our members, assist IWA HQ on issues

## ORGANISING THE WORK WITHIN MIA



- Monthly electronic MC meetings (1 hour)
- Tri-monthly focused YWP meetings + mentoring
- Open MIA SG meeting at major conferences (1/yr)
- Short newsletter (generated from IWAconnectPlus)
- Posting news on IWA\_ConnectPlus and other media
- Manage open MIA website for non-IWA members
- Produce MIA part of the IWA Global Trend Report series
- Close collaboration with IWA HQ, IWA SC2SG and IWA Learn

# ORGANISING THE WORK WITHIN MIA



- Strong focus on TGs and WGs
- Organise conferences and workshops (IWA/MIA events)
- Organise workshops or sessions at non-IWA/MIA conferences (SETAC, IFAC)
- Organise webinars
- Create MIA visibility on social medias (LinkedIn, Twitter, YouTube)
- **Create friendships**
- **Remember face-to-face social activities**

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# MIA MANAGEMENT COMMITTEE

- “Time is the enemy” – ALL SG WORK is VOLUNTARY!
- Dedicated MC members essential
- MC: 14 senior members (+ outgoing chair for 2 years) & 14 **associated YWPs** working in teams

- **MC** more **ACTIVE** and **DYNAMIC**
- Higher work **CAPACITY**
- Create **OPPORTUNITIES** for YWPs

Across  
11 Countries  
≈ 20 Institutions



# PHILOSOPHY ASSOCIATED YWPs



Active program to fully engage, mentor and involve YWPs

- Every “full” MC member teamed up with associated YWP
- Teams made up from different research groups
- Senior MC members take on mentoring role
  - Train YWPs in leadership
  - Actively involve them in MC activities
- Associated YWPs can grow into full MC members if place opens up
- This innovative approach has now been adopted by many other SGs

## ASSOCIATED YWPs

- Much of the MC work is handled by our YWPs
- Great thanks to former chair Ingmar Nopens
- Great thanks to all MIA MC YWPs

# MANAGEMENT COMMITTEE

- ❑ Lluis Corominas (Webinar Coordinator)
- ❑ Bruce Johnson (Industrial Insight Officer)
- ❑ Kimberly Solon (Administrative Coordinator)
- ❑ Giacomo Bellandi (TG and WG Coordinator)
- ❑ Lina Belia (Industrial Insight Officer)
- ❑ Lloyd Townley (Conference and Workshop Coordinator)
- ❑ Andreia Amaral (IWA Connect+ Officer)
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- ❑ Marie-Noëlle Pons (Webmaster)
- ❑ Peter Bach (YWP Relations Officer)
- ❑ Juan Baeza (SG Outreach Coord.)
- ❑ Sina Borzooei (Social Media Coord.)

## Associated YWPs

- Feiyi Li
- Arifur Rahman
- Fanlin Meng
- Fabio Polesel
- Gamze Kirim
- Sovanna Tik
- Gabriel Capson-Tojo
- Vacant
- Mahmudul Hasan
- Christoffer Wärrf
- Borja Valverde-Pérez
- Ahmed Shaqfa



Ulf Jeppsson  
(Chair)

IEA, Lund University, Sweden

**Associated YWP:**  
Saba Daneshgar



Elena Torfs  
(Vice chair)

Université Laval, Canada

**Associated YWP:**  
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## MIA GROUP MEMBERS



- 1918 members (according to IWACONnect, Sept. 6, 2022)
- 671 members (according to IWACONnect+, Sept. 23, 2023)
- Disastrous development, the chair must step down!!??

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# TASK GROUPS AND WORKING GROUPS

- MIA has a strong focus on TGs and WGs
- MC YWP liaisons to all TGs and WGs
- Request on our TGs: report on progress, update website etc
- Hopefully soon IWAconnect+ subpages for each TG and WG

# TASK GROUPS AND WORKING GROUPS

## Task Groups (TGs)

- Design and Operations Uncertainty (DOU), chair Lina Belia (**Finished**)
- Generalised Physico-Chemical Modelling (PCM), chair Damien Batstone (**Finished**)
- Use of Modelling for Minimizing GHG Emissions from Wastewater Systems (GHG), chair Jose Porro (**Finished**)
- Membrane Bioreactor Modelling and Control, chair Giorgio Mannina
- Good Modelling Practice in Water Resource Recovery Systems, chair Patrick Dunlap

## Working Groups (WGs)

- Integrated Urban Water Systems (IUWS), chair Peter Bach
- Computational Fluid Dynamics (CFD), chair Julien Laurent (**Finished**)
- Life Cycle Analysis (LCA), chair Lluís Corominas (**Finished**)
- Good Modelling Practice (GMP), chair Günter Langergraber (**Finished**)
- Hybrid Modelling Working Group (HMWG), chair Sina Borzooei (**New**)
- Generalized Physico-Chemical Modelling, chair Damien Batstone (**Soon**)
- Modelling of Phototrophic systems (**Soon**)

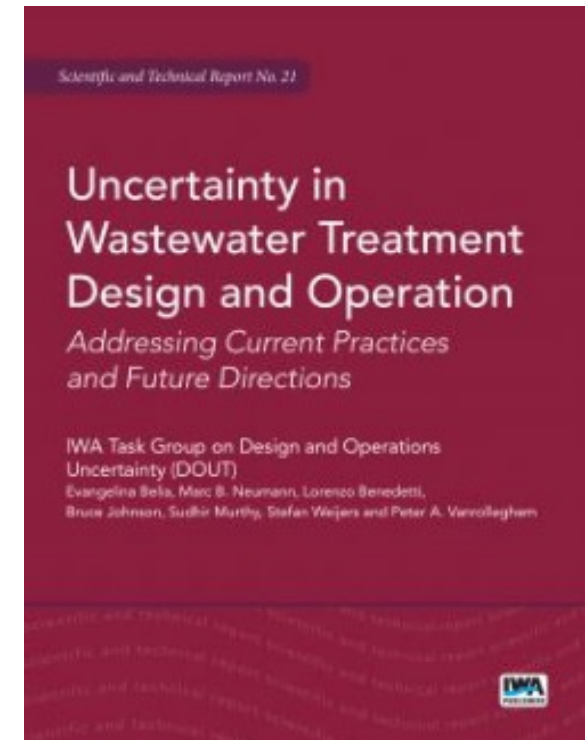
**IDEAS for NEW TGs or WGs?**



# TG: Design and Operations Uncertainty

(Chair: Lina Belia – Liaison: Christoffer Wärrff)

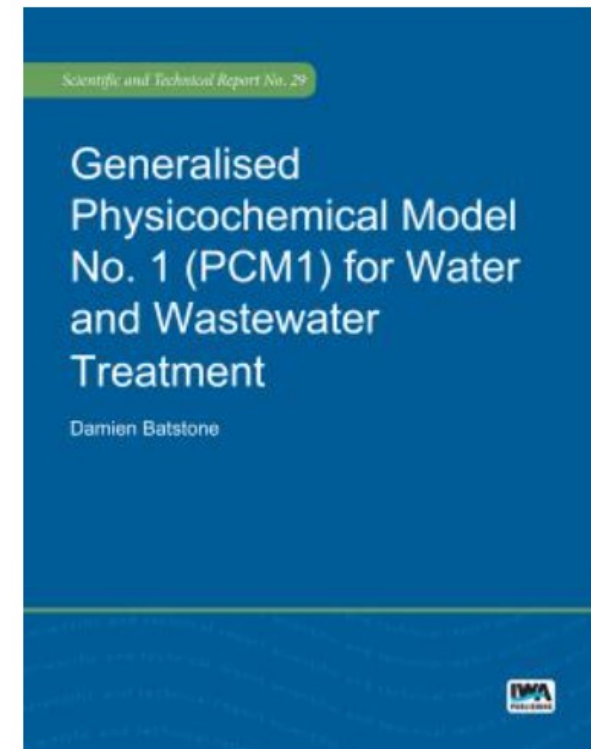
- Goals:
  - Increase efficacy and transparency of wastewater infrastructure (design/operations) via the use of numerical simulation with statistical analysis
- Activities
  - Workshop during Watermatex 2019
  - Webinar February 6, 2018
  - STR published late 2021 (**open access**)



# TG: Generalized Physicochemical Framework

(**Chair:** Damien Batstone – **Liaison:** Kimberly Solon)

- **Goals:**
  - Develop a physicochemical framework with high predictive capacity that is usable across the range of unit operations by both modelers and end-users
- **Activities:**
  - STR published late 2022 (**open access**)



# TG: Modelling of GHG emissions

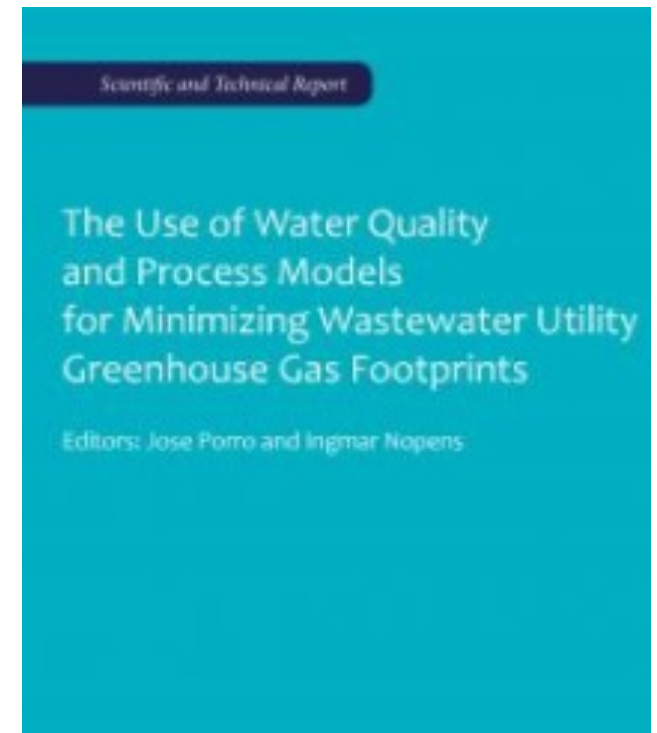
(Chair: Jose Porro – Liaison: xxx)

## ■ Goals:

- Understand the processes that are responsible for the major contributions to GHG emissions from WWTPs and sewer systems
- Translate this knowledge into mathematical models

## ■ Activities:

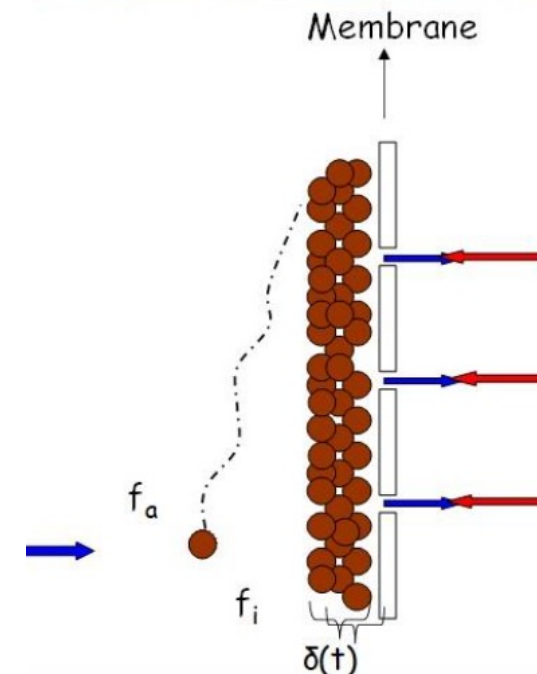
- Development of an N<sub>2</sub>O Field Measurements Guide
- Open webinar on Sept. 21, 2021
- STR published in 2022 (**open access**)



# TG: MBR modelling and control

(Chair: Giorgio Mannina – Liaison: Saba Daneshgar)

- Goals:
  - Propose standardized criteria to integrate biological, filtration and energy models for modelling of MBR-based systems.
  - Set-up a database that can be used for plant-wide modelling, control and optimization of MBR-based systems.
- Activities
  - Workshops during UDM 2018, Watermatex 2019 and WRRmod2021
  - Special session during 9<sup>th</sup> IWA-MTC conference 2019



# TG: Good Modelling Practice in Water Resource Recovery Systems



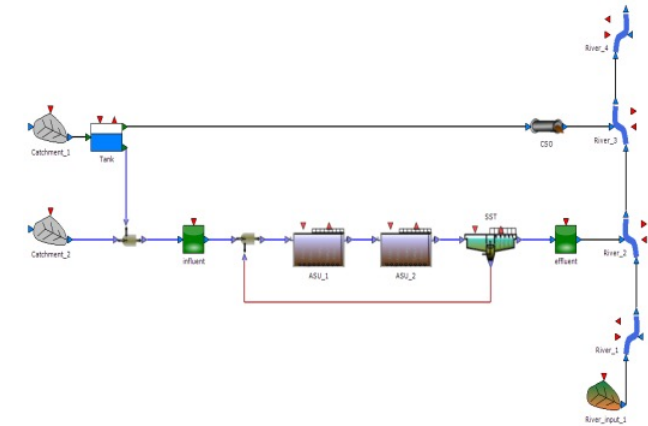
(Chair: Patrick Dunlap – Liaison: Kimberly Solon)

- Goals:
  - Evaluate the adoption of the previous STR.
  - Assess the state of WRRF modelling practice (broadening the focus of the first GMP Task Group, e.g., focus on plant-wide modelling)
  - Provide practitioners with updated and extended guidance to meet new challenges of the industry (e.g., from wastewater treatment to resource recovery systems).
- Activities
  - Start of preparation of STR (review, update, development of new chapters)

# WG: Integrated Urban Water Systems

(Chair: Peter Bach – Liaison: Sovanna Tik)

- Goals:
  - Integration of models of all components of the water cycle in urban areas including the nutrients and energy cycles
- Activities:
  - Creation of an IWA *WaterWiki* group and a LinkedIn Group for dissemination
  - Webinar September 26, 2017
  - Organization of workshops in Watermatex2015, Urban Drainage 2015, YWP Conference 2019, WRRmod2021
  - *Upcoming*: White paper on barriers to integrated modelling



## IWA MIUWS Working Group

MENU

### About MIUWS

Home » About MIUWS

Both policy makers and industry are increasingly realizing the necessity to adopt an integrated approach to water management. In Europe, this is clearly stated in the Water Framework Directive, and by the recent funding of large research projects on that topic (e.g. PREPARED, SANITAS, TRUST). In North America, recent activities confirm this direction, e.g. the USEPA's Integrated Planning and Permitting Initiative and integrated planning framework, two new WERF Research Challenges: "Linking Contaminant Sources to Receiving Water Impacts" and "Sustainable Integrated Water Management". Other areas in the world are already following closely. IWA has launched the "Cities of the Future" programme, which has strong integration components.

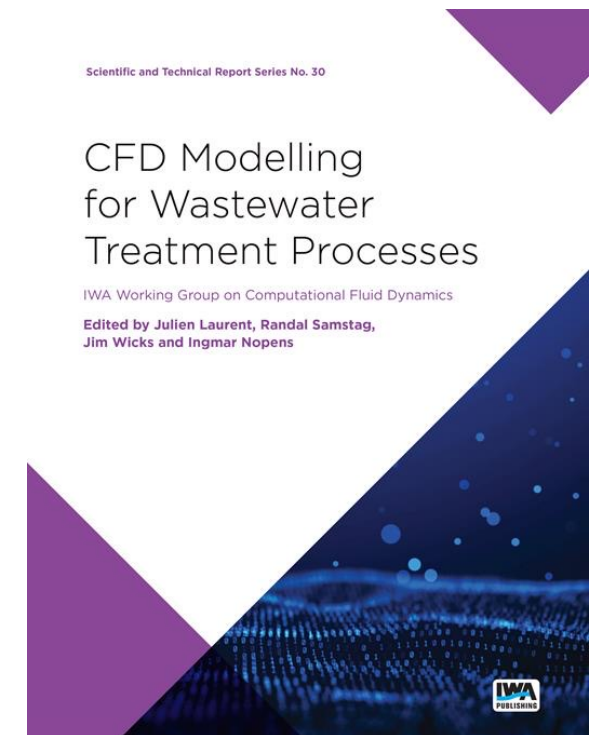
### Website:

<http://miuws.org/index.php/sample-page/>

# WG: Computational Fluid Dynamics

(Chair: Julien Laurent – Liaison: Gamze Kirim)

- Goals:
  - Develop guidance documents and hands-on training for good modelling practice in CFD for wastewater treatment modelling
  - Consensus building on state-of-the-art knowledge gaps and future needs
- Activities:
  - Workshop during Watermatex2019, WRRmod2018 and WEFTEC 2017
  - Webinar February 5, 2019
  - Scientific and technical report published in 2022, **open access**
  - **Finished**



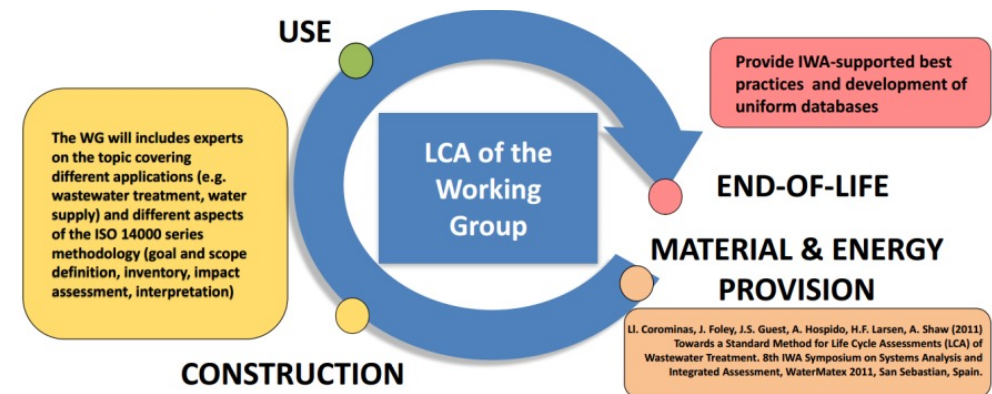
# WG: Life Cycle Analysis

(Chair: Lluís Corominas)

- Goals:
  - To facilitate the exchange of ideas and develop consensual methodologies, in order to promote better use of LCA in the urban water systems

## □ Activities:

- Workshop during Watermatex 2019
- Published white paper on “Life cycle assessment applied to wastewater treatment: An operational guide”
- **Finished**





# WG: Good Modelling Practice

(Chair: Günter Langergraber)

## ■ Goals:

- Create a new Task Group on Good Modelling Practice with a wider perspective (outside AS system)
- Recruit members for such a TG and transfer knowledge
- Continue to provide courses etc. on Good Modelling Practice

## □ Activities:

- **Goals achieved**
- **Finished**

# WG: Hybrid Modelling (NEW)

(Chair: Sina Borzooei – Liaison: xxx)

## ■ Goals:

- To disseminate the latest work on application of HM in water sector
- Investigate and harmonise terminology
- Facilitate exchange of early ideas and experiences
- Identify gaps in current knowledge and practices
- Create an open-source platform with a Git repository
- Develop a test case study of HM and openly shared data

## □ Activities:

- HM workshop at WRRmod2021 and at WWC&E2022
- Review article published in WST
- Webinar November 10, 2020
- **Formally initiated in August 2022**

# MIA WEBINARS VIA IWA\_LEARN



1. **Overcoming data issues and barriers to integrated modelling in practice** – September 26, 2017 – 225 registered attendees
2. **Modelling resource recovery: State-of-the-art and future challenges** – February 6, 2018 – 461 registered attendees (an IWA record at the time)
3. **New advanced in advanced biological phosphorous removal** – July 9, 2018 – 250 registered attendees
4. **Computational Fluid Dynamics: Applications and good modelling practice** – February 5, 2019 – 380 registered attendees
5. ***Wastewater Disinfection Modelling*** – October 24, 2019 – (392 attendees)
6. ***Advanced Oxidation Process Modelling*** – November 14, 2019 (452 attendees)
7. ***Hybrid Models in Wastewater: Merging mechanistic with data-driven*** – November 10, 2020 (419 attendees)

## MIA WEBINARS BY MIA SG



8. **Advancements on N<sub>2</sub>O modelling in water resource recovery facilities – September 21, 2021 – approx. 100 attendees (also YouTube)**
9. **Modelling wastewater treatment resilience for improved decision making and resource recovery– October 21, 2021 – approx. 100 attendees (also YouTube)**
10. **State-of-the-art in anaerobic digestion modelling – November 22, 2021 – approx. 100 attendees (also YouTube)**
11. **State-of-the-art modelling on anaerobic mixed-culture fermentation – March 31, 2022 – approx. 100 attendees (also YouTube)**
12. ***The incorporation of risk and uncertainty in mathematical models to aid the design and operations of WRRFs – June 8, 2022 – approx. 100 attendees (also YouTube)***

# MIA WEBINARS BY MIA SG



- 13. Modelling greenhouse gas emissions from urban wastewater systems: State-of-the-art and beyond – November 21, 2022 – approx. 100 attendees (also YouTube)**
  
- 14. Modelling of phototrophic systems for resource recovery from wastewater – December 21, 2022 – approx. 100 attendees (also YouTube)**
  
- 15. Modelling and integrated assessment tools for water sensitive urban planning – April 13, 2023 – approx. 100 attendees (also YouTube)**
  
- 16. Generalized physicochemical model (PCM) for wastewater processes – May 19, 2023 – approx. 100 attendees (also YouTube)**

# MIA UPCOMING WEBINARS



17. Integrated modelling

18. Digital twins

19. CFD modelling

20. Water reuse modelling

# JOIN US TO SHOW OFF YOUR IDEAS AT A MIA WEBINAR



- You are invited: workshop organizers, speakers, expertise...
- Any topics related to water modelling, simulation, optimization...
- Collaborate with us [webinars@iwa-mia.org](mailto:webinars@iwa-mia.org) for your webinar proposal

# UPCOMING CONFERENCES

## 11<sup>th</sup> Symposium on Modelling and Integrated Assessment (Watermatex2023)

- Location: Québec City, Canada, 23-27 Sep., 2023
- Chair/vice-chair: Prof. Peter Vanrolleghem (Univ. Laval)/Prof. Elena Torfs (Univ. Laval)

## 9<sup>th</sup> Water Resource Recovery Modelling seminar (WRRmod2024)

- Location: Notre Dame, Indiana, USA, 6-10 April, 2024
- Organisers: Adrienne Menniti, Leon Downing, Tom Johnson, Rob Nerenberg
- **Decision for WRRmod2026 soon to appear**
- **Watermatex2027?**





# PROCEEDINGS ON IWA\_CONNECT+ LOST



## Publications

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- [WRRmod2021, Virtual](#)
- [WRRmod2018, Québec, Canada](#)
- [WWTmod2016, Annecy, France](#)
- [WWTmod2014, Spa, Belgium](#)
- [WWTmod2012, Québec, Canada](#)
- [WWTmod2010, Québec, Canada](#)
- [WWTmod2008, Québec, Canada](#)

- [Watermatex2019, Copenhagen, Denmark](#)
- [Watermatex2015, Queensland, Australia](#)
- [Watermatex2011, San Sebastian, Spain](#)
- [Watermatex2007, Washington DC, USA](#)
- [Watermatex2004, Beijing, China](#)
- [Watermatex2000, Ghent, Belgium](#)

- [ICA2017, Québec, Canada](#)
- [ICA2013, Narbonne, France](#)
- [ICA2009, Cairns, Australia](#)
- [ICA2001, Malmo, Sweden](#)

• [FICWTM2017, Palermo, Italy](#)

- [AutMoNet2007, Ghent, Belgium](#)
- [AutMoNet2004, Vienna, Austria](#)
- [AutMoNet2002, Vienna, Austria](#)

• [IT&Water2012, Amsterdam, The Netherlands](#)

## OTHERS



- Steering committee member to [IWA digital water program](#) (Saba Daneshgar)
- IWA Global Trend Report **2022**: Emerging Topics in Modelling and Integrated Assessment
- MIA **core member** of new IWA [cluster on Wastewater-based Epidemiological Surveillance](#)
- Yearly summary of MIA activities on our web sites

# SOCIAL MEDIA



Follow the Modelling and Integrated Assessment Specialist Group on



<https://www.iwaconnectplus.org/>



<https://www.linkedin.com/company/iwa-mia-specialist-group-on-modelling-and-integrated-assessment>



IWA MIA Specialist Group

128 subscribers

MIA SG open website

<http://iwa-mia.org>



[https://twitter.com/iwa\\_mia\\_sg](https://twitter.com/iwa_mia_sg)

To get informed about our latest events, opportunities, publications, webinar recordings and news!

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Ulf Jeppsson  
(Chair)

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**Associated YWP:**  
Saba Daneshgar



Elena Torfs  
(Vice chair)

Université Laval, Canada

**Associated YWP:**  
Tri Le

# CALL FOR NEW MC MEMBERS



- Call for applications will soon be open!
  - Senior and associated YWP members
- Application: [Instructions](#) soon on IWAconnect+ and social media
- Selection: Electronic voting by senior MC members

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- Introducing new chair and vice-chair for MIA SG

# INTRODUCING NEW CHAIR OF MIA SG



Dr Elena Torfs

Université Laval, Canada

Period of 4 years



# INTRODUCING NEW CHAIR OF MIA SG



**YES!**

**YES!**

Dr Elena Torfs

Université Laval, Canada

Period of 4 years

# INTRODUCING NEW VICE-CHAIR OF MIA SG



Dr Saba Daneshgar  
Ghent University, Belgium  
Period of 4 years

## INTRODUCING NEW VICE-CHAIR OF MIA SG



**YES!**

**YES!**

Dr Saba Daneshgar  
Ghent University, Belgium  
Period of 4 years

# FINAL REMARKS



- These slides will be available on IWAconnect+ (MIA) and MIA open web site
- The next MIA Open Group meeting will be either at WRRmod2024 (Notre Dame, USA, April 2024) or IWA WWC&E2024 (Toronto, Canada, August 2024)



**for your attention!**

**Discussion, questions and comments!**