

CIM ICM

M T L 2 3





Convention + Expo
APR 30 - MAY 3 Montréal

Building trust to decarbonize the world

Submit your poster

IMPORTANT DATES

MARCH 3, 2023	MARCH 17, 2023	APRIL 21, 2023
		
Poster abstract submission deadline	Email notification send date	Poster recording submission deadline

POSTER SUBMISSION

- Please upload your poster at: <https://bit.ly/3VgcZOE>
- In "Select a topic", select: **Student Poster Competition**

POSTER GUIDELINES

All posters must be either English or bilingual (French & English). Poster presentations must include paper title, author name(s) and affiliation(s), abstract, introduction, experimental procedure, results and discussion, conclusion, references, acknowledgement and contact person.

There is no need to upload a PowerPoint presentation of your poster

SIZE AND DETAILS

Max size:

Width: 1,143 m (45")

Height: 1,136 m (44.75")

Please bring Velcro sticky dots to mount your poster (poster boards are Velcro receptive)

Guidelines

RECORDING OF PRESENTATION

We ask that students record a 1-2 min summary and a maximum 10 min MP4 video presentation online at <https://bit.ly/3VgcZOE>. The 1-2 min video will be used at the convention to help promote your poster and attract attendees to the young leaders pavilion. The 10 min video presentation will be posted on a virtual platform following the convention for all attendees to view.

If you also wish to have your 10 min presentation featured on the CIM Academy (academy.cim.org), kindly sign the form in the submission folder. The recording is made on the same platform as the poster upload. It is an easy process where you will have a chance to view your recording, edit or delete, and record again.

(W) 1920 px X (H) 1080 px / 16.9 aspect ratio

REGISTRATION

Poster presenters must register through the CIM Convention website:

<https://convention.cim.org>



Guidelines

PRESENTATION TIME

Poster presentations will follow the trade show hours:

Sunday, April 30, 17:00 to 20:00

Monday, May 1, 10:00 to 17:00

Tuesday, May 2, 10:00 to 17:00

It is not compulsory to attend to your poster full time during the convention. However, poster presenters are expected to stand in front of their posters during the Monday and Tuesday coffee breaks and luncheons. There will be no audio-visual equipment for the Poster Session.

INSTALLATION AND REMOVAL

Installation: Sunday, April 30, 8:00 to 15:00

Removal: Tuesday, May 2, after 17:00 (end of trade show)

PRESENTATION TIME

The 3 winners will be announced on Tuesday, May 2, between 12:00 to 14:00 at the Student - Industry Luncheon.





IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT:

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FINE BUBBLES

- Fine gridding for mineral liberation: reality for low-grade and finely disseminated ores.
- Low probability of collision with conventional bubbles and low flotation rates [1].

Ultrafine bubbles = nanobubbles

Fig. 1. Bubble classification by size. Reproduced from [2].

FINE BUBBLES TO RECOVER FINE PARTICLES

- Promote fine particle aggregation:

Particle-bubble probability of collision

Faster induction time.

Fig. 2. Schematic representation of a flotation circuit to recover fine particles by hydrodynamic interaction.

OBJECTIVES AND CHALLENGES

- 1) To discuss the detection of various methods.
- 2) To discuss the differences between in-situ and ex-situ measurements.
- 3) To discuss the accuracy and precision below 1 µm.
- 4) Distinction between bubbles and mineral particles/contaminants (e.g. reagent assemblage).
- 5) Static measurements.

High-speed imaging Depends on pixel resolution typically 10-30 µm

Focused beam reflectance measurement (FBRM) 1 µm [4] (minimum chord length) *In situ, dynamic*

Laser diffraction 10 nm (low solids volume %) *Ex situ, static*

Dynamic light scattering (DLS) – Zeta Sizers 0.3 nm *Ex situ, dynamic*

Nanoparticle tracking analysis (NTA) 10 nm *Ex situ, dynamic or static*

Atomic force microscopy (AFM) Depends on geometric parameters of the device but can reach fractions of nm. *Ex situ, dynamic or static*

FUTURE PERSPECTIVES

- 1) Continuous measurements and/or proper/representative sampling for batch tests as bubble and aggregates' behaviours might differ in a static environment.
- 2) Techniques that allow a transition to high flow-rate (pilot and industrial) flotation systems, to validate the benefits of the use of fine bubbles [5].
- 3) Techniques that focus on fine bubbles generated by hydrodynamic cavitation which is the most employed method at all scales due to its low operational cost.

REFERENCES

(1) J. Metzner, J. Rietor, C. Fontijn. The limits of fine particle flotation. *Miner. Eng.* 23 (2010) 402-427.

(2) C. Pankaj, B. Razi, M. Nooshari, A. V. Nguyen, S. Chelgani. General principles for the design of fine bubble technology. *Miner. Eng.* 23 (2010) 1810-1818.

(3) Y. Bai, A. Deshpande, Z. Zhu, X. Zhang, Y. Yu. <https://doi.org/10.1016/j.miner.2019.101997>

(4) A. Akhmed, H. Okawa, J. Rabin. <https://doi.org/10.1016/j.miner.2019.101997>

(5) S. Naezi, S. Shafiq, A. Haseen, S. J. B. S. <https://doi.org/10.1016/j.miner.2019.101997>

Acknowledgments

The authors thank the other members of Bubcker's research group for giving support for this research.

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