The Learning and Teaching of Calculus Across Disciplines 2

16-20 Jun 2025 Milan (Italy)

Parallel sessions of presentations

📍 *Settore Venezian, Via Venezian 15, Città Studi, Milan*

🗓️ Monday 16 June 2025 (afternoon) – Thursday 19 June 2025 (afternoon)

Monday, June 16th

Session 1A: Rate of change and derivatives

🗓️ Date: 16/06/25

⏰ Time: 16:15-17:15

📍 Room: V2

Shaista Kanwal, Mahboubeh Nedaei: *Students' reasoning about dynamic rate of change visualizations*

Devin Hensley: *Students Concept Mapping the Derivative & Novel Tools for Analysis*

Session 1B: Differentials 1

🗓️ Date: 16/06/25

⏰ Time: 16:15-17:15

📍 Room: V1

Tevian Dray, Corinne Manogue, Elizabeth Gire: *Using differentials in thermodynamics*

Corinne Manogue, Tevian Dray, Paul Emigh: *Partial derivatives in thermodynamics*

Tuesday, June 17th

Session 2A: Innovative teaching practices

🗓️ Date: 17/06/25

⏰ Time: 11:00-12:30

📍 Room: V9

Rebecca Dibbs, Mehmet Celik: *STEM majors perceived value of an introductory calculus course-based research experience*

Alice Barana, Mats Brunström, Maria Fahlgren, Marina Marchisio Conte, Fabio Roman, Matteo Sacchet, Mirela Vinerean, Yosief Wondmagegne: *On students' perception of explorative, translation, and example-generation tasks for understanding Calculus in one variable*

Giulia Bini, Maura Salvatori: *MATH-CHIAVELLI: Designing a Calculus Card Game*

Session 2B: Extramathematical contexts and Calculus concepts

🗓️ Date: 17/06/25

⏰ Time: 11:00-12:30

📍 Room: V10

María Trigueros, Rafael Martínez-Planell: *Using an economics model to introduce systems of differential equations*

Tommy Dreyfus, Anatoli Kouropatov: *Chemistry contexts for introducing derivative and integral*

Steve Bennoun: *Teaching Multivariable Calculus to Biology Students*

Session 3A: Accumulation and integral 1

🗓️ Date: 17/06/25

⏰ Time: 13:30-14:30

📍 Room: V9

Gilat Falach, Anatoli Kouropatov, Tommy Dreyfus: *An unexpected construct toward the fundamental theorem*

Charlotte Zimmerman, Suzanne White Brahmia: *Accumulation as a tool towards blending reasoning about quantity and rate of change in physics contexts*

Session 3B: Digital Technologies

🗓️ Date: 17/06/25

⏰ Time: 13:30-14:30

📍 Room: V10

Asia Majeed, Alexandre Cavalcante: *MAPLE LEARN: Investigation of Students' Experience in Learning the Calculus Course in Ontario*

Ottavio Rizzo: *LLMs as world builders for authentic problems in calculus for STEM students*

Wednesday, June 18th

Session 4A: Modelling

🗓️ Date: 18/06/25

⏰ Time: 11:00-12:30

📍 Room: V9

Jennifer Czocher, Brendan Kelly, Steve Bennoun, Alan Garfinkel: *Reflections on a Master Class in Teaching Modelling to Life Science Majors*

Lídia Serrano, Catarina Lucas: *Connecting Mathematics and Medicine in a Calculus Course in Biomedical Engineering Degrees through SRPs*

Session 4B: Curriculum and resources

🗓️ Date: 18/06/25

⏰ Time: 11:00-12:30

📍 Room: V10

Michael Loverude, David Robles, Maxwell Ichinose: *Re-examining calculus practice in introductory physics*

Pauline Hellio: *Potential and limitations of resources for supporting students using mathematics in physics: a case study about differential equations*

Thursday, June 19th

Session 5A: Accumulation and integral 2

🗓️ Date: 19/06/25

⏰ Time: 11:00-12:30

📍 Room: V9

Andrew Izsak, Olha Sus, Emmanuel Daring, Mathias Lopez: *Partitioning Physical Attributes for Riemann Sum Approximations*

Melinda Lanius: *On Narratives of the Definite Integral in Biocalculus*

Suzanne White Brahmia: *Calculus quantities and conservation laws in physics*

Session 5B: Textbook analysis

🗓️ Date: 19/06/25

⏰ Time: 11:00-12:30

📍 Room: V10

Haile Gilroy, Isabel Harris: *On doing and undoing in general and applied precalculus-calculus tracks*

Mónica Arnal-Palacián, Ignacio González-Ruiz, Antonio M. Oller-Marcén: *Multivariable limits in different university degrees: A first approach through textbook analysis*

Christian Heinz, Michael Kunz, Stefan Müller, Hans-Stefan Siller: *Basic Mental Models of the Integral: A Didactical Approach for Lecturers of Thermodynamics*

Session 6A: Differentials 2

🗓️ Date: 19/06/25

⏰ Time: 15:00-16:00

📍 Room: V9

Mathilde Hitier, Frank Feudel, Ida Landgärds-Tarvoll: *Differentials across disciplines: Conceptions used in economics, physics, and chemistry*

Domenico Galli, Barbara Gadani, Olivia Levrini: *The evolution of the concept of infinitesimal and differential in physics through the analysis of university textbooks*

Session 6B: Teacher education

🗓️ Date: 19/06/25

⏰ Time: 15:00-16:00

📍 Room: V10

Henry Alexander Ramírez Bernal: *Role of some referents of Mathematics education in teachers' reflections on the causes of students' errors in university mathematics*

Johan Lie, Stian Hirth, Tobias Eiksund: *Integrating Computational Thinking into Undergraduate Calculus in Mechanics: Insights from Educators and Communities of Practice*

Session 7A: Epistemological issues

🗓️ Date: 19/06/25

⏰ Time: 16:30-17:30

📍 Room: V9

Ricardo Karam: *Should the Cauchy-Riemann equations be named after d'Alembert?*

Brian Faulkner, Imène Ghedamsi, Thomas Lecorre: *On engineering students' challenges with the delta function*

Session 7B: Covariational reasoning

🗓️ Date: 19/06/25

⏰ Time: 16:30-17:30

📍 Room: V10

Sara Bagossi, Osama Swidan, Yotam Vaknin: *Interpreting simulations of a physical phenomenon: insights from an eye-tracking study*

Yixiong Chen: *An Analysis of Covariational Reasoning for the Conceptual Introduction of Derivative in US and Chinese Calculus Textbooks*

Poster session

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🗓️ Tuesday 17 June 2025 (afternoon); 16:15 - 17:15

Room: V10

Pietro Milici, Michela Maschietto, Anita Lugli: *A history-based artifact to mediate calculus contens*

Dan Klein, Edit Yerushalmi, Bat-Sheva Eylon: *Compromise between calculus and physics in teaching: instructors' views on the role of mathematics in advanced physics courses for teachers*

Megan Wawro, Kaitlyn Stephens Serbin, Jacob Lineberry: *Developing aspects of the wave function in quantum mechanics through analogical activity: A textbook analysis*

Stefania Lippiello, Luca De Vidi, Marta Carli, Ornella Pantano: *Enhancing Understanding of Integrals in Physics and Mathematics Education: A revision of the Test of Calculus and Vectors in Mathematics and Physics*

Miguel Díaz Chávez: *Derivative. Meaning in filling containers*

Dan Klein, Edit Yerushalmi, Bat-Sheva Eylon: *The role of calculus in advanced physics courses for teachers-instructions' view*

Matthew Rudy Meangru: *Utilizing an AI Math Bot in Undergraduate Mathematics Classrooms to Explore Students Learning Calculus*