



# THE UNIVERSITY OF CHICAGO

## COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

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DEJAN SLEPCEV

Department of Mathematical Sciences  
Carnegie Mellon University

Nonlocal Wasserstein Metric, Gradient Flows on Point Clouds and  
Their Continuum Limits

THURSDAY, February 18, 2021 at 4:15pm

Via ZOOM

ABSTRACT

We will discuss evolution equations on graphs and their continuum limits. We consider transport equations on graphs, where mass is distributed over vertices and is transported along the edges. We will discuss a graph analogue of the Wasserstein distance, in the particular case where the notion of density along edges is inspired by the upwind numerical schemes. The continuum analogue of such distances is the nonlocal Wasserstein distance whose properties will be discussed.

In the second part of the talk we will discuss the gradient flows on graphs and their continuum limits. In particular we will interpret the nonlocal-interaction equation equations on graphs as gradient flows with respect to the graph-Wasserstein quasi-metric of the nonlocal-interaction energy. We show that for graphs representing data sampled from a manifold, the solutions of the nonlocal-interaction equations on graphs converge to solutions of an integral equation on the manifold. The talk is based on joint works with Esposito, Patacchini, Schlichting, and Warren.

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**Organizer:**

Daniel Sanz-Alonso, Department of Statistics, [sanzalonso@uchicago.edu](mailto:sanzalonso@uchicago.edu)  
CAM Colloquium URL: <https://cam.uchicago.edu/events/cam-colloquium/>.

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