



THE UNIVERSITY OF  
**CHICAGO**

THE COMMITTEE ON  
COMPUTATIONAL AND  
APPLIED MATHEMATICS

## COLLOQUIUM

---

FERNANDO GUEVARA VASQUEZ

Mathematics Department  
University of Utah

**A discrete potential theory on weighted graphs**

**THURSDAY, March 5th at 4:00 PM**

Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

### ABSTRACT

We present a discrete potential theory on weighted graphs. Our goal is to define operators analogous to the continuum potential theory relying only on knowledge of the graph Laplacian and a partition of the nodes into interior, exterior and boundary. Our definition of single and double layer operators allows to bring classic results from potential theory to weighted graphs. In particular we show that single, double layer potential and hypersingular operators obey classic continuum identities related to the Calderón and the Dirichlet-to-Neumann maps. We also give a discrete analogous to a classic result on the spectrum of the Neumann-Poincaré operator.

Organizers:

Guillaume Bal, Department of Statistics (CCAM), [guillaumebal@uchicago.edu](mailto:guillaumebal@uchicago.edu) & Nisha Chandramoorthy, Department of Statistics (CCAM), [nishac@uchicago.edu](mailto:nishac@uchicago.edu), Daniel Sanz-Alonso, Department of Statistics (CCAM), [sanzalonso@uchicago.edu](mailto:sanzalonso@uchicago.edu)

CAM Colloquium URL: <https://cam.uchicago.edu/events/cam-colloquium/>