



**Department of Mathematics and Statistics**

**COLLOQUIUM**

**Tuesday, October 28th, 2014**

4:00 – 5:00 pm, Adel Mathematics Bldg., Room 164  
(refreshments at 3:45)

**Dr. Viacheslav Fofanov**

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**Computational Challenges in Microbial Forensics**

Abstract

Microbial Forensics seeks to use biochemical properties of bacterial samples to track a germ used as a weapon (as part of criminal activity or bioterrorism event) to its source. In this context, the presence of rare variants in otherwise homogeneous bacterial populations, could act as a sample's fingerprint. Recently developed High Throughput Sequencing technologies (HTS) can, in a cost acceptable manner, produce sufficient amount of sequence data for sensitive detection of ultra-rare variants (present in 0.1% of the sample). However, the specificity of ultra-rare variant SNP detection (at levels  $<1\%$ ) still remains a major limiting factor of this technology.

This talk will focus on the statistical, computational, and biological challenges (and potential solutions) associated Microbial Forensics, the HTS technology and the ultra-rare variant detection.

ACGT Seminar: Tuesdays 12:45 – 1:45 pm, AMB 164.

Applied Math Seminar (AMS): Thursdays 12:45 – 1:45 pm, AMB 164.

Friday Afternoon Undergraduate Mathematics Seminar (FAMUS) meets Fridays at 3pm, AMB 164