



Pacific Institute *for the*
Mathematical Sciences

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Emergent Research: The PIMS Postdoctoral Fellow Seminar

October 14, 2020

**9:30 AM Pacific / 10:30 AM Mountain / 11:30 AM Central
Zoom**



PIMS is launching a new lecture series! Every three weeks, you will have the opportunity to connect with emerging research in the mathematical sciences from a PIMS Postdoctoral Fellow. PIMS PDFs are amongst the top young researchers in Canada, and this is an excellent opportunity to learn about them, and their work.



Shuxing Li, PhD

PIMS Postdoctoral Fellow

Packings of Partial Difference Sets

Abstract: As the underlying configuration behind many elegant finite structures, partial difference sets have been intensively studied in design theory, finite geometry, coding theory, and graph theory. Over the past three decades, there have been numerous constructions of partial difference sets in abelian groups with high exponent, accompanied by numerous very different and delicate techniques. Surprisingly, we manage to unify and extend a great many previous constructions in a common framework, using only elementary methods. The key insight is that, instead of focusing on one single partial difference set, we consider a packing of partial difference sets, namely, a collection of disjoint partial difference sets in a finite abelian group. Although the packing of partial difference sets has been implicitly studied in various contexts, we recognize that a particular subgroup reveals crucial structural information about the packing. Identifying this subgroup allows us to formulate a recursive lifting construction of packings in abelian groups of increasing exponent.

Bio: Shuxing Li received his Ph. D. degree in Mathematics from Zhejiang University, China, in 2016. From September 2016 to September 2017, he was a postdoctoral fellow at Department of Mathematics, Simon Fraser University. He was an Alexander von Humboldt Postdoctoral Fellow from October 2017 to September 2019, at Faculty of Mathematics, Otto von Guericke University Magdeburg, Germany. Since November 2019, he is a PIMS Postdoctoral Fellow at Department of Mathematics, Simon Fraser University. His research focuses on finite configurations with strong symmetry, which involves algebraic and combinatorial design theory, algebraic coding theory, and finite geometry. In 2018, he received the Kirkman Medal from the Institute of Combinatorics and its Applications in recognition of the excellence of his research.

REGISTRATION: <https://www.pims.math.ca/seminars/PIMSPDF>