



## **TSG 4      Activities for, and research on, mathematically gifted students**

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### **Description**

The aim of TSG 4 is to involve educational researchers, research mathematicians, mathematics teachers, teacher educators, curriculum designers, doctoral students, and others in a forum for exchanging insights related to activities for, and research on, mathematically gifted students. The focal topics will include empirical, theoretical and methodological issues related to the themes below. Current and historical research and suggestions for new research paths might be included in each category.

#### **1. Nature of Giftedness**

- What do we know and what do we need to know about mathematical giftedness?
- Is mathematical giftedness a discovery or a creation?
- What theoretical frameworks and methodologies are helpful in identifying, creating, valuing, and educating mathematically gifted students in different contexts/ societies?

#### **2. Students**

- What does recent research in cognitive science and neuroscience bring to understanding the development of mathematical talent and innovation in students of all ages and from all backgrounds?
- In what ways are cognitive, social, and affective aspects connected in gifted students?
- What are the differences between novices and experts?

- How are mathematical creativity and giftedness connected?

### 3. Pedagogy/Programs

- How could teaching best encourage and promote mathematical talents?
- How might classroom interactions and discourse contribute to the development of mathematical reasoning?
- What teaching strategies, curricula, technology, special schools or other in- and out- of school programs and activities might lead students to discover and realize their mathematical promise and talents?
- How is high-level mathematical innovation developed?

### 4. Teacher Education

- What types of mathematics and pedagogy are suitable for educating pre-service and in-service teachers for the gifted?
- How should lessons/units planning be structured in order to address special needs of gifted?
- What types of assessment are most effective for identifying, challenging and nurturing mathematical giftedness and innovation?
- What types of local, regional, national or international co-operation between researchers and educators should be emphasized for the promotion of mathematical talent and giftedness?

Papers from previous TSGs can be found at <http://tsg.icme11.org/tsg/show/7> and [http://www.icme12.org/sub/sub02\\_05.asp](http://www.icme12.org/sub/sub02_05.asp). Also of interest: ICME-Affiliated group, Mathematical Creativity and Giftedness ([www.igmcg.org](http://www.igmcg.org)).

### Invited Speakers:

Carmel Diezmann	(Australia)
Roza Leikin	(Israel)
Michael Mholo	(South Africa)
Stephanie Schiemann	(Germany)
Bharath Sriraman	(USA)
Bruce Vogeli	(USA)
Yeap Ban Har	(Singapore)