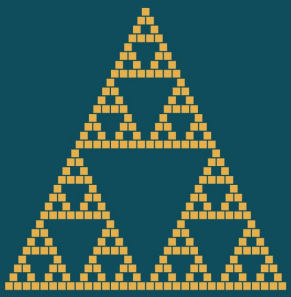
İZMIR INSTITUTE OF TECHNOLOGY · DEPARTMENT OF MATHEMATICS

Number Theory and Combinatorics III



November 6, 2026

One-day workshop · Third meeting of the series

Invited Speakers

Kübra Benli

Boğaziçi University

Ümit Işlak

Boğaziçi University

Nihan Tanısalı

INRIA Saclay & École polytechnique

PLACE

IZTECH, Mathematics Department
Seminar room 122

TIME

09:45 – 17:00

REGISTRATION

Deadline: November 2, 2026
For registration, visit math.iyte.edu.tr

ORGANIZERS

Haydar Göral
Sinem Benli Göral
Doruk Üstündağ

TÜRK MATEMATİK DERNEĞİ

Dear Participants,

Number Theory and Combinatorics III is a one-day event whose aim is to bring together researchers and students working on number theory, combinatorics and the many places where these two areas meet. This is the third meeting of the series. The first Number Theory and Combinatorics workshop took place on November 18, 2022, and the second one followed on November 1, 2024, both at the Department of Mathematics of İzmir Institute of Technology. Both meetings were supported by the Turkish Mathematical Society, and we are happy that Number Theory and Combinatorics III is supported by the Society as well. We are sincerely grateful to them for their continued support.

This year the program also includes poster presentations, which we hope will create more room for conversation and for getting to know each other's work. We would like to thank our invited speakers, the poster presenters and everyone who joins us for making this day possible. We hope the workshop will be a pleasant opportunity to learn about recent developments in number theory and combinatorics and to exchange ideas. Welcome, and enjoy the day!

Yours sincerely,
Organizing Committee

Organizing Committee

Haydar Göral	İzmir Institute of Technology
Sinem Benli Göral	İzmir Institute of Technology
Doruk Üstündağ	İzmir Institute of Technology

İzmir Institute of Technology, November 6, 2026

Program

09:45 – 10:15	Opening
10:15 – 11:30	**Ümit Işlak**
11:30 – 13:15	Lunch Break
13:15 – 14:30	**Kübra Benli**
14:30 – 15:00	Coffee Break and Poster Presentations
15:00 – 16:15	**Nihan Tanısalı**
16:15 – 16:45	Poster Presentations and Closing

Poster Presenters

Ayten Erilmez
Deniz Göksu
Sudenaz Sunsal
Talip Can Termen
Zeynep Üstün Biçer

All talks take place in Seminar room 122, Department of Mathematics, IZTECH.

İzmir Institute of Technology, November 6, 2026

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A Potpourri of Subsequence Problems

Ümit Işlak

Boğaziçi University

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Subsequence problems arise naturally in probability, combinatorics, and many other areas of mathematics. Despite their often elementary formulations, they lead to surprisingly rich mathematical questions and reveal interesting connections between seemingly unrelated topics. In this talk, we will explore a variety of subsequence problems, beginning with simple examples such as the longest alternating subsequence. We will then turn to the classical longest increasing subsequence problem and several of its variations, including those involving unfair random permutations, random intervals, and higher-dimensional settings. We will also discuss the longest common subsequence problem and some recent and ongoing work on longest convex subsequences and related questions. The talk will be largely self-contained, with an emphasis on the underlying ideas, mathematical phenomena, and open questions rather than technical details.

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Prime Numbers in Arithmetic Progressions

Kübra Benli

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Let $q \geq 3$ be an integer. Let a be an integer relatively prime to q. The prime number theorem for arithmetic progressions gives an asymptotic formula for the number of primes $p \leq x$ with $p \equiv a \bmod q$. In this talk, we will first investigate this asymptotic formula with available error terms. Then, we will focus on the sign of the normalized error term for the count of primes in arithmetic progressions, briefly introducing some problems in "Comparative Prime Number Theory". Finally, based on a joint work with Greg Martin and Paul Péringuey, we will discuss the logarithmic density of positive real numbers x for which the normalized error terms for the counts of primes $\equiv a \bmod q$ and $\equiv b \bmod q$ up to x are of the same sign for $(ab, q) = 1$; under the Generalized Riemann Hypothesis and the Linear Independence Hypothesis.

Box Progressions

Nihan Tanısalı

INRIA Saclay & École polytechnique

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Given balls and boxes both enumerated by the positive integers, we consider a sequential allocation of the balls into the boxes. We fix $\ell \geq 2$. Proceeding in increasing order of box labels, assign to each box the next r smallest balls for some $1 \leq r \leq \ell$. Given an integer $k \geq 3$, is there a natural number N such that in any placement of N balls into boxes, there exist k balls whose labels and box labels each form a k-term arithmetic progression?

In this talk, we explore the connection between this question and abelian power-free words over a binary alphabet. We address the question by constructing suitable fixed points of morphisms and present sufficient conditions under which a morphism is abelian k-power-free. Our conditions extend Dekking's result over a binary alphabet and offer a weaker, yet more effective alternative to Carpi's. We discuss examples and their implications for the ball-box problem. Finally, we briefly introduce a sieve technique for the template method, which helps verify abelian power-freeness of fixed points.