EIT Topology Conference

2025 8.18-20
Ningbo · China

宁波东方理工大学
EASTERN INSTITUTE OF TECHNOLOGY, NINGBO

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About EIT

Eastern Institute of Technology, Ningbo (EIT), with a high starting point, is poised to emerge as a new type of High-level, International, Research-oriented university initiated by social forces and highly supported by the governments of Zhejiang Province and Ningbo City, as well as other social forces. Chen Shiyi, a renowned educator and academician of the Chinese Academy of Sciences, serves as the Founding President of EIT.

EIT is committed to fostering social development through exceptional education, cutting-edge research, and a culture of innovation. At the heart of EIT’ s mission is the aspiration to advance economic and social progress of both the region and the nation. To achieve this, EIT emphasizes foundational and applied research, propelling advancements in engineering and technology, and highlighting interdisciplinary and impactful research in science, engineering, information technology and business management, supplemented by humanities and social sciences.

EIT aims to nurture innovative talents with ambitious aspirations and pragmatic mindsets, equipping them with a solid academic foundation, robust competencies, innovation skills, a sense of patriotism, and a global perspective.

Our Mission

EIT aims to become a new type of international, high-level, innovative research university that puts emphasis on the cultivation of top-notch innovative STEM scholar and the synthesis of foundational and applied research. EIT applies itself to interdisciplinary research in cutting-edge fields, with a view to contributing to the economic and social development of both the region and the nation.



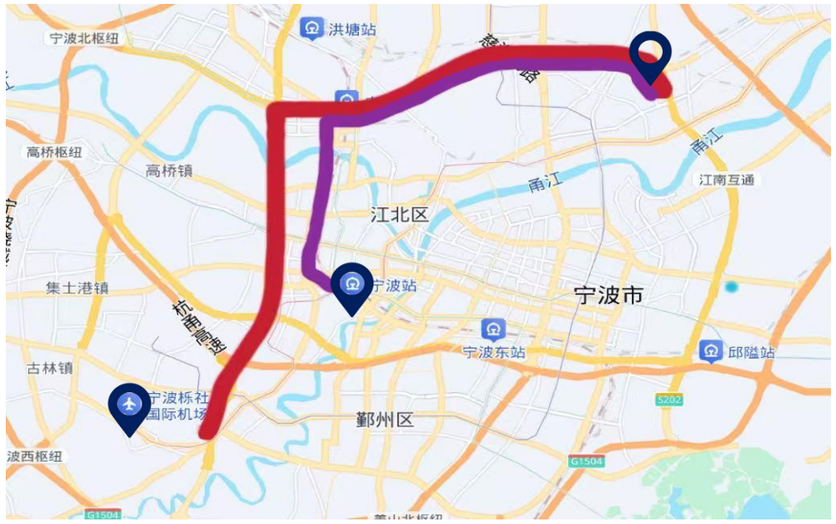
About EIT Low-dimensional Topology Conference

This is the first topology-focused conference to be held at the newly established Eastern Institute of Technology, Ningbo. As a newly founded institution with a strong commitment to excellence in mathematical research, we are proud to host this event as part of our effort to build a vibrant research environment. The conference aims to bring together leading experts and active researchers in various areas of topology to promote collaboration and exchange of ideas. Topics will include: 3 and 4 dimensional topology, symplectic topology, and algebraic topology.

Attendees

Habib Alizadeh Université de Montréal	Yuanyuan Bao Tohoku University	Qingtao Chen Xi'an Jiaotong-Liverpool University	Wenzhao Chen ShanghaiTech University
Zhechi Cheng Wuhan University	Zhiyun Cheng Beijing Normal University	Yuan Gao Nanjing University	Jean Gutt Université Toulouse
Dongtai He Tongji University	Siqi He AMSS	Jia Kong Zhejiang University	Mijia Lai Shanghai Jiaotong University
Sangjin Lee KIAS	Ping Li Fudan University	Youlin Li Shanghai Jiaotong University	Zhenkun Li AMSS
Wenbo Liao The Chinese University of Hong Kong	Dexie Lin Chongqing University	Jianfeng Lin Tsinghua University	Xiang Liu Heibei Normal University
Jiming Ma Fudan University	Jie Min UMass Amherst	Yu Pan Tianjin University	Qianhe Qin Stanford University
Ruifeng Qiu East China Normal University	Yang Qiu Nankai University	Shiquan Ren Henan University	Toshio Saito Joetsu University of Education
Motoo Tange University of Tsukuba	Ran Tao Sichuan Normal University	Jiajun Wang Peking University	Luya Wang IAS
Weibiao Wang Zhongnan University	Enxin Wu Shantou University	Zhongtao Wu The Chinese University of Hong Kong	Haibo Yang Nanchang Hangkong University
Jingling Yang Xiamen University	Yan Yang Zhejiang University	Hang Yuan BIMSA	Jun Zhang University of Science and Technology of China
Shuo Zhang AMSS	Yingchun Zhang Shanghai Jiaotong University	Xuezhi Zhao Capital Normal University	Shengmao Zhu Zhejiang Normal University

MAP



Line
Route Airport - Hotel
Distance About 33km
Duration About 40min by taxi

Line
Route High speed railway station - Hotel
Distance About 24km
Duration About 30min by taxi



Line
Route Hotel-Tentative Campus
Distance About 500m
Duration About 7min on foot

SCHEDULE

August 17th

Zhenhai Grand New Century Hotel, Ningbo
镇海开元名都酒店

TIME	PROGRAM
15:00-19:00	Registration

August 18th

MBA Conf. Room, 1F, Building 1, EIT Tentative Campus

TIME	SPEAKER	PROGRAM	HOST
09:00-09:20	Jie Shen	Opening Ceremony	
09:20-10:20	Motoo Tange	Handle decomposition of exotic elliptic surfaces	Jiajun Wang
10:20-10:45		Break	
10:45-11:45	Jianfeng Lin	On mapping class groups of 4-manifolds	Jiajun Wang
11:45-12:45		lunch Siwan Western Restaurant, Floor 2, Zhenhai Grand New Century Hotel	
13:30-14:30	Zhenkun Li	Instanton 2-torsion and Dehn surgery	Shengmao Zhu
14:30-15:00		Break	
15:00-16:00	Sangjin Lee	A higher-dimensional generalization of pseudo-Anosov surface mapping class	Shengmao Zhu
16:10-17:10	Yuanyuan Bao	On Thompson Knot Theory and Conjugacy Classes of Thompson's Group	
17:30-20:00		Dinner 宁海食府 Ning Hai Shi Fu, No.888 Tongxin Road, Zhenhai Distrct	

SCHEDULE

August 19th

MBA Conf. Room, 1F, Building 1, EIT Tentative Campus

TIME	SPEAKER	PROGRAM	HOST
09:00-10:00	Jia Kong	From Equivariant to Motivic Homotopy: A Deformation Perspective	Xuezhi Zhao
10:00-10:20		Break	
10:20-11:20	Toshio Saito	Risandle coloring and the fundamental groups of 3-manifolds	Xuezhi Zhao
11:20-12:20		lunch Siwan Western Restaurant, Floor 2, Zhenhai Grand New Century Hotel	
13:30-14:30	Zhongtao Wu	Surgeries on lens spaces and the Heegaard Floer d-invariant	Ping Li
14:30-15:00		Break	
15:00-16:00	Siqi He	Recent progress on Z2 harmonic spinors on 4-manifolds	Ping Li
16:10-17:10	Qingtao Chen	Recent progress on various Volume Conjectures	
17:30-20:00		Dinner 食在有点味 Shi Zai You Dian Wei, Floor 2, Kaiyuan Plaza	

SCHEDULE

August 20th

MBA Conf. Room, 1F, Building 1, EIT Tentative Campus

TIME	SPEAKER	PROGRAM	HOST
09:00-10:00	Youlin Li	Knotted solid tori in contact manifolds	Jiming Ma
10:00-10:20		Break	
10:20-11:20	Jean Gutt	Characterizing symplectic capacities	Jiming Ma
11:20-12:20		lunch Siwan Western Restaurant, Floor 2, Zhenhai Grand New Century Hotel	
13:30-14:30	Jun Zhang	Hamiltonian shape invariant and its quantitative applications	Yuan Gao
14:30-15:00		Break	
15:00-16:00	Habib Alizadeh	Lagrangian spectral invariants and fragmentation in dimension four	Yuan Gao

KEYNOTE SPEECH

Motoo Tange
University of Tsukuba

Handle decomposition of exotic elliptic surfaces

The elliptic surface E(n) is simply connected closed 4-manifold. It is well-known that there exist exotic structures by using log transform E(n)_{p,q} or knot surgery E(n)_K. We give handle decompositions without 1-handles under some condition. Also, we give a cork in E(1)_{p,q} for some small p,q.

Jianfeng Lin
Tsinghua University

On mapping class groups of 4-manifolds

In this talk, I will discuss some recent results regarding mapping class groups of 4-manifold, using invariants from configuration spaces. In particular, I will sketch a proof that the mapping class group of a surface cross the 2-sphere is not finitely generated. I will also talk about some connections with Gabai's lightbulb theorem. And I will discuss some applications in symplectic topology. This talk is based on a joint work with Boyu Zhang, Yi Xie and a joint work with Weiwei Wu.

Zhenkun Li
AMSS

Instanton 2-torsion and Dehn surgery

Instanton Floer homology was introduced by Floer in 1980s and has become a power invariants for three manifolds and knots since then. It has lead to many milestone results, such as the approval of Property P conjecture. Heegaard diagrams, on the other hand, is a classical combinatorial methods to describe 3-manifolds. In principle, Heegaard diagrams determine 3-manifolds and hence determine their instanton Floer homology as well. However, no explicit relations between these two objects were known before. In this talk, for a 3-manifold Y, I will talk about how to extract some information about the instanton Floer homology of Y from the Heegaard diagrams of Y. Additionally, I will explore some of the applications and future directions of this work. This is a joint work with Baldwin and Ye.

Sangjin Lee
KIAS

A higher-dimensional generalization of pseudo-Anosov surface mapping class

I will introduce a higher-dimensional generalization of idea/notions in surface theory. Such a generalization usually does not hold in topology, so we should work in the setting of symplectic topology. At the beginning of the talk, I will explain why symplectic structure allows such a generalization to happen. Then, I will talk my result, which is a specific generalization (of pseudo-Anosov as mentioned in the title.) If time permits, we will also discuss possible further researches in this direction.

Yuanyuan Bao
Tohoku University

On Thompson Knot Theory and Conjugacy Classes of Thompson's Group

Jones introduced a method to construct unoriented links from elements of Thompson's group F, and showed that any link can be obtained in this way. In this talk, I will explain the basic motivations and key ideas of this theory, and discuss some questions related to it and the conjugacy classes of F. This talk is based on joint work with Xiaobing Sheng.

Jia Kong
Zhejiang University

From Equivariant to Motivic Homotopy: A Deformation Perspective

Equivariant and motivic stable homotopy theories are two central theories in modern algebraic topology. Over the real numbers and C_2 equivariantly, These two worlds are closely connected by the Betti realization functor. We explore a deformation approach to understanding this relationship. In joint work with Angelini-Knoll, Behrens, and Belmont, we reinterpret a key computational tool—the C_2-effective spectral sequence—in a way that not only clarifies its role in the real motivic setting, but also suggests a generalization to equivariant homotopy theory for other groups C_p. This leads to a broader picture of deforming equivariant homotopy theory toward motivic analogs up to a Borel completion, with potential computational and conceptual applications.

Toshio Saito
Joetsu University of Education

Risandle coloring and the fundamental groups of 3-manifolds

For a closed oriented 3-manifold with a non-singular flow, we always consider a simple spine, which we call a flow spine, in a good position with respect to the flow. Using a flow spine, we can describe the 3-manifold as a virtual knot diagram. In this talk, we first recall the risandle coloring invariant of 3-manifolds through their virtual knot diagrams. Then we discuss a connection between risandle coloring and the fundamental group. This is joint with Ippei Ishii and Takuji Nakamura.

Zhongtao Wu
The Chinese University of Hong Kong

Surgeries on lens spaces and the Heegaard Floer d-invariant

This talk explores the fascinating connection between lens space surgery and DNA topology. In particular, we introduce the Montesinos' trick, which lifts band surgery between links to Dehn surgery between 3-manifolds under double branched covers. We will focus on the simplest case of the torus links T(2,n) and the lens spaces L(n,1). This is a joint work with JinglingYang.

Siqi He
AMSS

Recent progress on Z2 harmonic spinors on 4-manifolds

Z2 harmonic spinors, introduced by Taubes, describe the boundary of the two spinor Seiberg-Witten moduli space, playing a key role in the study of analytic aspects of a new gauge theoretical equation. Understanding their boundary structure is essential for the potential development of new gauge theory invariants for 3 and 4-manifolds. We will discuss some recent progress on this deformation problem for Z2 harmonic spinors on 4-manifolds, based on joint work with G. Parker and T. Walpuski.

Qingtao Chen
Xi'an Jiaotong-Liverpool University

Recent progress on various Volume Conjectures

The original Volume Conjecture of Kashaev-Murakami-Murakami predicts a precise relation between the asymptotics of the colored Jones polynomials of a knot in S^3 and the hyperbolic volume of its complement. I will first discuss two different directions that lead to generalizations of this conjecture.

The first direction concerns different quantum invariants of knots, arising from the colored SU (n) (with the colored Jones polynomial corresponding to the case n = 2). I will first display subtle relations between congruence relations (joint work with K. Liu, P. Peng and S. Zhu), cyclotomic expansions and the original Volume Conjecture for colored Jones polynomials of knots. I will then generalize this point of view to the colored SU (n) invariant of knots. Certain congruence relations for colored SU (n) invariants lead us to formulate cyclotomic expansions and a Volume Conjecture for these colored SU(n) invariants and we also proved the case of the figure eight knot, which is a joint work with K. Liu and S. Zhu. We also proved cyclotomic expansion for the colored SU(n) invariants of double twist knots which is also a joint with K. Liu and S. Zhu.

Another direction for generalization involves the Witten-Reshetikhin-Turaev and the Turaev-Viro quantum invariants of 3-manifolds. In a joint work with T. Yang, we formulated a new Volume Conjecture for the asymptotics of these 3-manifolds invariants evaluated at certain roots of unit, and numerically checked it for many examples. Interestingly, this conjecture uses roots of unity that are different from the one usually considered in literature. This may indicate that the understanding of this new phenomenon requires new physical and geometric interpretations that go beyond the usual quantum Chern-Simons theory. I will also introduce a work on Krillov-Reshetikhin quantum 6j-symbols done by J. Murakami & me.

Finally I will explain some recent progress on various Volume Conjectures by using methods, a combination of Poisson summation formula and Saddle Point method, which is pioneered by Kashaev and further developped by Yokota, and finalized by Ohtsuki. These are recent joint works with S. Zhu.

Youlin Li
Shanghai Jiaotong University

Knotted solid tori in contact manifolds

In this talk, I will present several recent results concerning knotted solid tori in contact 3-manifolds. Specifically, I will discuss the width of a knot type and provide criteria for when it equals the maximal Thurston-Bennequin invariant, as well as when it exceeds it. Additionally, I will show that there are many "non-thickenable" tori in various knot types, a phenomenon previously observed only in the 3-sphere. This work is joint with John Etnyre and Bulent Tosun.

Jean Gutt
Université Toulouse

Characterizing symplectic capacities

It is a long-standing conjecture that all symplectic capacities which are equal to the Gromov width for ellipsoids coincide on centrally symmetric convex domains in $\mathbb{R}^{2n}$. It is known that they coincide for monotone toric domains in all dimensions. I shall explain whether requiring a capacity to be equal to the k^{th} Ekeland-Hofer capacity for all ellipsoids can characterize it on a class of domains. This is joint work with Vinicius Ramos.

Jun Zhang
University of Science and Technology of China

Hamiltonian shape invariant and its quantitative applications

In this talk, we introduce a non-linear symplectic capacity for 4-dimensional Euclidean domains X, known as the shape invariant of X, which describes the embeddability of product Lagrangian tori into X. We will present a computational framework for this invariant using techniques from symplectic field theory. Furthermore, we explore its applications in uncovering new obstructions to symplectic embeddings and detecting Hamiltonian knottedness of Lagrangian tori. This talk is based on joint work with Richard Hind.

Habib Alizadeh
Université de Montréal

Lagrangian spectral invariants and fragmentation in dimension four

We first shortly introduce the Polterovich-Shelukhin Lagrangian spectral estimators defined on the space of Hamiltonian functions on a product of two spheres. One objective of the talk will be to prove C^0-continuity of PS-spectral estimators for which we shall use fragmentation. Continuity of these spectral estimators have interesting applications among which is the proof of the long-standing simplicity conjecture which was first proved by Cristofaro-Gardiner-Humilière-Seyfaddini. In the second part of the talk, we explain how one can use pseudo-holomorphic curves in dimension four to prove fragmentation type results and we show its application to continuity of PS-spectral estimators. Finally, we mention some other applications to the Hofer geometry of four-dimensional polydisks.