

QBICWorkshop2023

Dates: From October 11 Wednesday, to October 13 Friday, 2023

Venue: Face to face and Zoom Meeting, Noda Campus,
Tokyo University of Science, Noda City, Japan



Hybrid 量子生命情報ワークショップ2023

東京理科大学野田キャンパス に於いて対面&Zoom 会議 開催のお知らせ

目的：本国際会議は、数学、物理学、情報科学、生命科学等の境界領域の基礎と応用に関わる最新の研究状況を把握し、今後の方向付けを与えることを目的とします。

期間： 2023年10月11日（水）～ 13日（金）

会場： 東京理科大学 創域理工学部 野田キャンパス
対面&Zoom Meeting

主催者： 創域理工学部情報計算科学科・渡邊 昇&入山聖史

連絡先： 〒278-8510 千葉県野田市山崎2641

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ウェブサイト： <https://www.rs.noda.tus.ac.jp/qbic/VQBICworkshop2023new.html>

Sponsor：東京理科大学，ナノ量子情報研究部門，RIST



Hybrid QBIC Workshop 2023

Noda Campus, Tokyo Univ. of Science

11th-13th October 2023



Invited Speakers

By using face to face and zoom

L. Accardi, Roma II University, Italy
M. Asano, Kindai University, Japan
I. Basieva, Linnaeus University, Sweden
R. Belavkin, Middlesex University, UK
D. Chruscinski, Nicolaus Copernicus University, Poland
F. Fagnola, Polytechnic University of Milan, Italy
W. Freudenberg, Brandenburg University of Technology, Germany*
F. Hiai, Emeritus Professor, Tohoku University, Japan*
A. Jamiolkowski, Nicolaus Copernicus University, Poland
Un Cig Ji, Chungbuk National University, Korea
A. Khrennikov, Linnaeus University, Sweden
S. Kozyrev, Russian Academy of Sciences, Russia
K. Kuchitsu, Tokyo University of Science, Japan
F. Mukhamedov, The United Arab Emirates University, U.A.E.
M. Yoshida, Kanagawa University, Japan
S. Lakaev, Samarkand State University, Uzbekistan
N. Obata, Tohoku University, Japan*
S. Oryu, Emeritus Professor, Tokyo University of Science, Japan
I. Ojima, Research Origin for Dressed Photon, Japan
R. Quezada, UAM - Izatapalapa Campus, Mexico
M. Regoli, Roma II University, Italy
K. Sanaka, Tokyo University of Science, Japan
Si Si, Emeritus Professor, Aichi Prefectural University, Myanmar
K. Sinha, Emeritus Professor of the Indian Statistical Institute & JNCASR, India
A. Stan, Ohio State University, U.S.A.
H. Takayanagi, Tokyo University, Japan *
J.S. Tsai, Tokyo University of Science & RIKEN, Japan
Y. Tanaka, National Collage of Nursing, Japan
S. Tarucha, RIKEN, Japan
T. Toyoda, Emeritus Professor, Tokai University, Japan*
D. Wanke, Ludwig-Maximilians-Universität München, Germany
S. Watabe, Shibaura Institute of Tecjnologi, Japan
I. Volovich, Steklov, Mathematical Institute, Russia
& QBIC members in Tokyo Univ of Science

Organizer

Watanabe N., & Iriyama S., Tokyo Univ of Science

Adivisory Committee

Accardi L., Jamiolkowski A., Khrennikov A., Volovich I.

Local Committee

Matsuoka T., Miyazaki S., Sato K., Kamizawa T., Kihara M., Jimbo K.

Program Detail URL

<https://www.rs.noda.tus.ac.jp/qbic/VQBICworkshop2023new.html>

Contact

Noboru Watanabe, Phone: +81-4-7124-1501 ext 3350
E-mail: watanabe@js.noda.tus.ac.jp

Main Session (TUS & International)

Oct 11th-13th 10:30-15:00(TUS)

Oct 11th-13th 15:10-18:00(International)

Organized by zoom

Poster Session

Oct 11th & 12th, Web site

Question and Answer, October 12,

Thursday 12:05 - 12:50 by zoom

Purpose

The main aim of QBIC and the conference is to create a new paradigm synthesizing Quantum Information and Bio-Informatics based on efforts by active researchers traversing various fields of Mathematics, Physics, Information and Life Science.

Sponsor

Tokyo University of Science

Nano-Quantum Information Research

Division, RIST



Hybrid QBIC Workshop 2023

Dates:

From October 11 Wednesday, to October 13 Friday, 2023

Venue:

Hybrid Workshop using Face to face and Zoom
Main Place : 6th floor Auditorium, Building No.7
Noda Campus of Tokyo University of Science
Noda City, Chiba 278-8510, Japan

a) Main Session (TUS & International Session)

October 11-13, Wednesday, Thursday, Friday 10:00 – 15:00 (**TUS Session**)
at Hybrid Workshop using (Face to face and Zoom)

October 11-13, Wednesday, Thursday, Friday 15:10 – 18:00 (**International Session**)
at Hybrid Workshop using Zoom

b) Poster Session

From October 11, Wednesday to October 12 Thursday
(Question and Answer, October 12, Thursday 12:05 - 12:50) web site and by zoom

URL <https://www.rs.noda.tus.ac.jp/qbic/VQBICworkshop2023new.html>

Hybrid QBIC Workshop 2023

Purpose

The main aim of QBIC and the conference is to create a new paradigm synthesizing Quantum Information and Bio-Informatics based on efforts by active researchers traversing various fields of Mathematics, Physics, Information and Life Science.

Organizer

N. Watanabe (Tokyo University of Science, Japan)

S. Iriyama (Tokyo University of Science, Japan)

Advisory Committee

L. Accardi (Roma II University, Italy)

A. Jamiolkowski, Nicolaus Copernicus University, Poland

A. Khrennikov, Linnaeus University, Sweden

I. Volovich (Steklov, Mathematical Institute, Russia)

Local Committee

T. Matsuoka (Suwa University of Science, Japan)

S. Miyazaki (Tokyo University of Science, Japan)

K. Sato (Tokyo University of Science, Japan)

T. Kamizawa (Sanyo-Onoda City University, Japan)

M. Kihara (Tokyo University of Science, Japan)

K. Jimbo (Tokyo University of Science, Japan)

Contacts

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Hybrid QBIC Workshop 2023

Invited Speakers

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M. Asano, Kindai University, Japan
R. Belavkin, Middlesex University, UK
I. Basieva, Linnaeus University, Sweden
D. Chruscinski, Nicolaus Copernicus University, Poland
F. Fagnola, Polytechnic University of Milan, Italy
W. Freudenberg, Brandenburg University of Technology, Germany*
F. Hiai, Emeritus Professor, Tohoku University, Japan*
A. Jamiolkowski, Nicolaus Copernicus University, Poland
Un Cig Ji, Chungbuk National University, Korea
A. Khrennikov, Linnaeus University, Sweden
S. Kozyrev, Russian Academy of Sciences, Russia
K. Kuchitsu, Tokyo University of Science, Japan
F. Mukhamedov, The United Arab Emirates University, U.A.E.
M. Yoshida, Kanagawa University, Japan
S. Lakaev, Samarkand State University, Uzbekistan
N. Obata, Tohoku University, Japan*
S. Oryu, Emeritus Professor, Tokyo University of Science, Japan
I. Ojima, Research Origin for Dressed Photon, Japan
R. Quezada, Universidad Autonoma Metropolitana, Iztapalapa Campus, Mexico
M. Regoli, Roma II University, Italy
K. Sanaka, Tokyo University of Science, Japan
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S. Tarucha, RIKEN, Japan
T. Toyoda, Emeritus Professor, Tokai University, Japan*
D. Wanke, Ludwig-Maximilians-Universität München, Germany
S. Watabe, Shibaura Institute of Technology, Japan
I. Volovich, Steklov, Mathematical Institute, Russia
QBIC members in Tokyo University of Science

Sponsor

Tokyo University of Science
Nano-Quantum Information Research Division, RIST

Program of Hybrid QBIC Workshop 2023

October 11, 2023, Wednesday - Main Session (TUS session 1)

- 10:00 ~ 10:05 *Opening Address* (Tokyo University of Science, Japan)
 10:10 ~ 10:55 S. Oryu, Emeritus Professor, Tokyo University of Science, Japan
Three-Body Cs(H₂, γ)La Nuclear Fusion in Cuboctahedron CsH₂ Pd₁₂
 11:00 ~ 11:45 T. Toyoda, M. Fujita, T. Uchida, K. Yamada, N. Hiraiwa, Tokai
 University, Japan
Theory of localized light
 11:45 ~ 13:15 **Lunch Break and Poster Presentatio**
 13:15 ~ 14:00 K. Sanaka, Tokyo University of Science, Japan
Optical fiber-based single photon emitter
 14:05 ~ 14:50 S. Iriyama, Tokyo University of Science
Disital Quantum Computation and Classical Teleportation Scheme

October 11, 2023, Wednesday - Main Session (International session 1)

- 15:00 ~ 15:10 *Opening Address* (Tokyo University of Science, Japan)
 15:15 ~ 16:05 L. Accardi, Roma II University, Italy
The quantum mechanics canonically associated to free and monotone probability
 16:10 ~ 17:00 F. Fagnola, Polytechnic University of Milan, Italy
Gaussian Quantum Markov Semigroups
 17:00 ~ 17:15 **Coffee Break**
 17:15 ~ 18:05 A. Khrennikov, Linnaeus University, Sweden,
What is life?": Open quantum systems approach
 18:10 ~ 19:00 R. Quezada, UAM-Iztapalapa Campus, Mexico City, Mexico
Dynamics of Perturbed G-Circulant Quantum Markov Semigroups
 19:05 ~ 19:55 A. Stan, Ohio State University, U.S.A.
Random variables for which some function of the number operator has a finite position-momentum decomposition
 19:55 ~ 20:10 **Coffee Break**
 20:10 ~ 21:00 D. Wanke, Ludwig-Maximilians-Universität München, Germany
TBA

October 12, 2023, Thursday - Main Session (TUS session 2)

- 10:00 ~ 10:45 Un Cig Ji, Chungbuk National University, Korea
Quantum Analogues of White Noise Delta functions
- 10:50 ~ 11:35 C. Uchiyama, University of Yamanashi, Japan
Environmental engineering of energy transport
- 11:35 ~ 12:05 **Lunch Break**
- 12:05 ~ 12:35 **Poster Presentation (Breakout Room in Zoom)**
- 12:35 ~ 13:20 N. Watanabe, Tokyo University of Science, Japan
Note on Transmitted Complexity of Modified Compound States for Quantum Dynamical systems
- 13:25 ~ 14:10 T. Matsuoka, Suwa Tokyo University of Science, Japan
TBA
- 14:15 ~ 14:55 T. Kamizawa, Sanyo-Onoda City University, Japan
On Quintic Positive Polynomials and the P-Reducibility
- 15:00 ~ 15:50 K. Sinha, Emeritus Professor of the Indian Statistical Institute & JNCASR, India
The Story of Two Projections and Quantum Classification Error

October 12, 2023, Thursday - Main Session (International session 2)

- 16:00 ~ 16:50 A. Jamiolkowski, Nicolaus Copernicus University, Poland
Nonperiodic sampling - Identifiability and Observability of Dynamical Systems
- 16:55 ~ 17:45 D. Chruscinski, Nicolaus Copernicus University, Poland
Quantum regression in dephasing processes
- 17:45 ~ 18:00 **Coffee Break**
- 18:00 ~ 18:50 F. Mukhamedov, The United Arab Emirates University, U.A.E.
Non-translation invariant Gibbs measures for the Ising model
- 18:55 ~ 19:45 S. Sritharan, Air Force Research Laboratory, U.S.A.
Nonlinear Filtering of Commutative and Noncommutative Systems: Spin Systems, Quantum Fields and Fluid Dynamics
- 19:45 ~ 20:00 **Coffee Break**
- 20:00 ~ 20:50 S. Lakaev, Samarkand State University, Uzbekistan
The Number and Location of Eigenvalues for the Two-Particle Schrödinger Operators on Lattices

October 13, 2023, Friday - Main Session (TUS session 3)

- 9:50 ~ 10:35 M. Asano, Kindai University, Japan
Clustering by simulation of self-organizing system
- 10:40 ~ 11:25 S. Watabe, Shibaura Institute of Technology, Japan,
Application of quantum computers to combinatorial optimization problem
- 11:30 ~ 12:15 Y. Sumino, Tokyo University of Science, Japan
Active matter - a type of information processing in biology
- 12:15 ~ 13:05 **Lunch Break**
- 13:05 ~ 13:50 M. Yoshida, Kanagawa University, Japan
A review on the historical developments of stochastic quantizations on Euclidean quantum fields and physical random medias
- 13:55 ~ 14:40 K. Kuchitsu, Tokyo University of Science, Japan
Spontaneous spikes, fluctuation and oscillation of calcium ion concentration in plants: possible significance in morphogenesis, signal transmission and environmental adaptation
- 14:45 ~ 15:30 Y. Tanaka, National Collage of Nursing, Japan
A Quantum-like approach to observing the heterogeneity in meta-analysis
- 15:35 ~ 16:25 R. Bhat, Indian Statistical Institute, Bangalore, India
Peripheral Poisson boundary

October 13, 2022, Friday - Main Session (International session 3)

- 16:30 ~ 17:20 I. Volovich, Steklov Mathematical Institute, Russia
Principle of Maximum Entropy in Quantum Cosmology and Negative Dimensions
- 17:25 ~ 18:15 S. Kozyrev, Steklov Mathematical Institute, Russia
Amplification of Quantum Transfer and Quantum Ratchet
- 18:15 ~ 18:30 **Coffee Break**
- 18:30 ~ 19:20 R. Belavkin, Middlesex University, UK
Value of Information Theory with Dynamic Information Constraints
- 19:25 ~ 20:15 R. Balu, US Army Research Lab, U.S.A.
Covariant Anyons via Mackey Machinery

List of Poster Presentations

1. Yuri Kagata, Koki Jimbo, Satoshi Iriyama, Tokyo University of Science, Japan
Inclusion Relations between Diffie - Hellman Type Algorithms and Strongly Asymmetric Public Key Agreement
2. Nichika Inabe, Koki Jimbo, Satoshi Iriyama, Tokyo University of Science, Japan
Note on Effective Attacks against Strongly Asymmetric Public Key Agreement Algorithms
3. Ayumu Daimon, Koki Jimbo, Maki Kihara, Satoshi Iriyama, Tokyo University of Science, Japan
A Study of Security Verification of Bio-Cryptography
4. Chihiro Okubo, Maki Kihara, Satoshi Iriyama, Tokyo University of Science, Japan
Note on A Subclass of Verifiable Encryption over Linear Space
5. Maki Kihara, Satoshi Iriyama, Tokyo University of Science, Japan
A Study of Quantum-like Teleportation Based on Adaptive Dynamics
6. Kaname Okado, Satoshi Iriyama, Tokyo University of Science, Japan
Note on Degree of Entanglement and Fidelity of Quantum Teleportation Using Squeezed State
7. Soichiro Morita, Satoshi Iriyama, Tokyo University of Science, Japan
A Study of Fidelity Measurement (Computation) and Optimal Squeezing Parameters of Quantum Teleportation Using Squeezed State
8. Yuki Arai, Satoshi Iriyama, Noboru Watanabe, Tokyo University of Science, Japan
A study of constructing controlled phase shift gate based on FTM gate
9. Kenji Hashimoto, Mariko Higashijima, Kayo Kamiya, Yuto Yamashita, Kazuyuki Kuchitsu, Tokyo University of Science, Japan
Reactive oxygen species produced in the apoplast by NADPH oxidases play critical roles in regulating the structure and mechanical properties of the cell wall in Marchantia polymorpha.
10. Yuto Yamashita, Yuki Hagiwara, Kenji Hashimoto, Hidemasa Suzuki, Ryuichi Nishihama, Kazuyuki Kuchitsu, Tokyo University of Science, Japan
Critical Roles and molecular mechanisms of Nox/Rboh-mediated ROS production in the regulation of cell division and cell cycle progression in Marchantia polymorpha
11. Hana Kojima, Toru Ikeuchi, Kenji Hashimoto, Kazuyuki Kuchitsu, Tokyo University of Science, Japan
Light control of polarized tip growth and Ca^{2+} dynamics of rhizoids in Marchantia polymorpha
12. Erina Seno, Yuka Yoshizawa, Yuto Yamashita, Kenji Hashimoto, Kazuyuki Kuchitsu, Tokyo University of Science, Japan
Spatio-temporal Pattern Analysis of Spontaneous Ca^{2+} Spikes in Marchantia polymorpha
13. Mizuki Ogawa, Kentaro Namiki, Ryuhei Toya, Sota Ogawa, Seigo Hoshino, Manami Awano, Hinaho Uesugi, Taiki Funahashi, Nobutaka Kitahata, Yuho Saito, Masataka Nakano, Kenji Hashimoto, Hiroshi Abe, Tadao Asami, Seisuke Kimura, Kouji Kuramochi, Kazuyuki Kuchitsu, Tokyo University of Science, Japan & *Meisei University
Mode of action and possible application of a novel compound that induces the accumulation of both jasmonic acid and salicylic acid in Arabidopsis.
14. Toru Ikeuchi, Hana Kojima, Kenji Hashimoto, Yutaka Sumino, Satoru Tshugawa, Nonoyama Tomonobu, Zichen Kang, Yukitaka Ishimoto, Kazuyuki Kuchitsu Tokyo University of Science, Japan
Quantitative analysis of fluctuation, oscillation and gradient of intracellular Ca^{2+} concentration at the growing tip of rhizoids in a liverwort, Marchantia polymorpha.
15. Hisaya Okahara and Kouji Tahata, Tokyo University of Science, Japan
On asymmetry models based on f -divergence for multi-way tables

16. Masayuki Miyashita[†] and Noboru Watanabe^{*}, ^{*}Tokyo University of Science, [†]Research Institute of Advanced Technology, SoftBank Corp., Japan
Study on Formulation of Mean Mutual Dynamical Entropy Based on Dynamical Entropy in Quantum Systems