

主催
Host 日本学術会議総合工学委員会
機械工学委員会合同力学基盤工学分科会

共催
Joint Hosting 日本工学会、応用物理学会、化学工学会、地盤工学会、土木学会、日本応用数理学会、日本風工学会、日本機械学会、日本気象学会、日本計算工学会、日本建築学会、日本原子力学会、日本航空宇宙学会、日本材料学会、日本地震工学会、日本数学会、日本船舶海洋工学会、日本伝熱学会、日本物理学会、日本流体力学会、日本レオロジー学会、農業農村工学会、日本計算数理工学会、日本混相流学会

協賛
Cooperation 自動車技術会

Purpose of Symposium

Classical mechanics is often regarded as a fundamental discipline established in each field, like the so-called four mechanics in mechanical engineering (mechanical dynamics, material mechanics, fluid mechanics, thermodynamics). However, with the expansion of the field of modern science, unsolved mechanics problems, for which theoretical models have not been constructed, have become apparent. In order to tackle these issues, it is necessary to integrate with a wide range of academic fields that are not bound by the existing basic academic fields, and it is indispensable to train and discover excellent researchers who will drive the flow of this integration. Based on this recognition, we will hold a symposium by young researchers who will lead the fundamental mechanical engineering of Japan. At the same time as an overview of the latest trends in cutting-edge research that can broaden the scope of classical mechanics research, we will also explore and discuss next-generation mechanics research that researchers based on classical mechanics should collaborate with other fields to pioneer. Also, the participation of students and young researchers will inspire the next generation of dynamics researchers.

開催趣旨

古典力学は、機械工学におけるいわゆる4力学（機械力学・材料力学・流体力学・熱力学）のように、分野ごとに確立された基盤学問のように捉えられがちであるが、現代科学が対象とする分野の拡大にともない、理論モデルが構築されていない未解決の力学の問題が顕在化している。これら諸課題に取り組むためには、既存の基盤学問領域の枠にとらわれない広範囲な学問分野との融合が必要であり、この融合の流れを牽引する優れた若手研究者の育成や発掘が不可欠である。このような認識に立脚し、我が国の力学基盤工学を牽引する研究者によるシンポジウムを開催する。古典力学研究の裾野を広げうる先端的研究に関する最新動向を俯瞰すると同時に、古典力学を基盤とする研究者が異分野と協働して新たに開拓すべき次世代力学研究を展望・討論する。また、学生や若手研究者の参加により、力学研究の次世代の担い手を鼓舞するものとする。

開催日時 : September 1 (Tue)- 3 (Thu), 2020 9:00AM～17:00PM
2020年9月1日(火)－3日(木)

オンライン開催 : Online (in English)

プログラム(Program) : <http://www.scj.go.jp/ja/event/index.html>

参加申込方法 (Registration) : <https://forms.gle/3bhMddLyG1C84xvp9>

参加を希望される方は、**8/29 (土) 12:00※**までに上記URLまたは右のコードより事前申込をお願いします。定員になり次第、事前申込みの受付は終了します。
※29日以降～会期中もお申し込みを受けつけますがオンライン開催場所URLのご案内が遅れることがありますのでご了承ください。

参加費無料 : Free of Charge



Kick-off Symposium of Japan Consortium for Theoretical and Applied Mechanics

Program

September 1 (Tue), 2020

9:30-11:30 Chair: Shu Takagi

Opening Speech: Kikuo Kishimoto, Koichi Hishida Muneo Hori and Yasuyuki Takata

Keynote Lectures:

1. Pinaki Chakraborty (OIST)
“Spectral theory of frictional drag in wall-bounded turbulent flows: a fresh perspective on an old problem”
2. Ettore Barbieri (JAMSTEC)
“Hydrodynamic peeling model of liquid-phase exfoliation of 2D materials”
3. Marco Edoardo Rosti (OIST)
“Progress towards Fiber Tracking Velocimetry to measure turbulent flows”

13:00-14:40

杵淵郁也（東京大学）, Ikuya Kinefuchi (The University of Tokyo)

“Application of the low-variance Monte Carlo method to the analysis of highly non-equilibrium evaporating gas flows”

村上陽一（東京工業大学）, Yoichi Murakami (Tokyo Institute of Technology)

“Mass transfer in forced-flow thermo-electrochemical cells: analytical solution of the mass-transfer resistance and explanation of the shape of the I-V curves”

矢吹智英（九州工業大学）, Tomohide Yabuki (Kyushu Institute of Technology)

“Heat transfer mechanisms in pool nucleate boiling observed by high-speed infrared thermography”

城田農（弘前大学）, Minori Shirota (Hirosaki University)

“Measurement and modeling of subcooled boiling in an impacting drop”

石本健太（京都大学）, Kenta Ishimoto (Kyoto University)

“Microswimmer hydrodynamics: theory and applications”

14:40-15:00 Break

15:00-16:20

田川義之（東京農工大学），Yoshiyuki Tagawa (Tokyo University of Agriculture and Technology)

“Highly viscous high-speed microjet induced by impulsive forces”

山西陽子（九州大学），Yoko Yamanishi (Kyushu University)

“Emerging functions of electrically-induced bubbles”

真田俊之（静岡大学），Toshiyuki Sanada (Shizuoka University)

“Force acting on a pair of clean bubbles rising in line”

市原美恵（東京大学），Mie Ichihara (The University of Tokyo)

“On the transition from flow to fracture of magma in explosive eruptions”

September 2 (Wed), 2020

9:30-11:30

原田周作（北海道大学），Shusaku Harada (Hokkaido University)

“Particle-like and fluid-like settling of a stratified suspension”

長津雄一郎（東京農工大学），Yuichiro Nagatsu (Tokyo University of Agriculture and Technology)

“Influences of physicochemical effects on interfacial hydrodynamics”

金子暁子（筑波大学），Akiko Kaneko (Tsukuba University)

“Relation between gas-liquid two-phase flow structure and bubble breakup behavior in a converging-diverging nozzle”

藤澤和謙（京都大学），Kazunori Fujisawa (Kyoto University)

“Erosion, dynamic response and parameter identification for soil structures”

古市幹人（海洋研究開発機構），Mikito Furuichi (JAMSTEC)

“Massively parallel granular simulation and stress chain characterization with

over billion particles”

市村強（東京大学）， Tsuyoshi Ichimura (The University of Tokyo)

“Earthquake simulations enhanced by high performance computing”

11:30-13:00 Lunch Break

13:00-14:40

長井宏平（東京大学）， Kohei Nagai (The University of Tokyo)

“Meso-scale simulation of damages of reinforced concrete structures using a discrete analysis model”

奥村大（名古屋大学）， Dai Okumura (Nagoya University)

“Buckling and postbuckling of pattern evolution from dimples to labyrinth”

岸本喜直（東京都市大学）， Yoshinao Kishimoto (Tokyo City University)

“Inverse problems in interfacial mechanics of multi-material structures”

荒木稚子（埼玉大学）， Wakako Araki (Saitama University)

“Mechanics and mechano-ionics of conductive ceramics”

安瀬地一作（農業・食品産業技術総合研究機構）， Issaku Azechi (NARO, National Agriculture and Food Research Organization)

“Transient test-based method for leak detection in pipeline”

14:40-15:00 Break

15:00-16:00

小林宏充（慶応義塾大学）， Hiromichi Kobayashi (Keio University)

“Two-way coupled dynamics in quantum turbulence of superfluid helium”

稲垣厚至（東京工業大学）， Atsushi Inagaki (Tokyo Institute of Technology)

“Turbulent flow characteristics within urban boundary layer”

堀之内武（北海道大学）， Takeshi Horinouchi (Hokkaido University)

“Dynamics of the atmosphere of Venus studied with image data from the Akatsuki

spacecraft”

September 3 (Thu), 2020

9:30-11:30

藤原宏志（京都大学）， Hiroshi Fujiwara (Kyoto University)

“Theoretical numerical analysis and computation of light propagation in biomedical tissue”

波田野明日可（東京大学）， Asuka Hatano (The University of Tokyo)

“Multiphysics simulation of cardiomyocytes reveals the critical role of the subcellular ultrastructure”

山田崇恭（東京大学）， Takayuki Yamada (The University of Tokyo)

“Topology optimization considering manufacturability using the fictitious physical models”

飯盛浩司（名古屋大学）， Hiroshi Isakari (Nagoya University)

“A new topology optimisation using level-sets of T-spline”

山中晃徳（東京農工大学）， Akinori Yamanaka (Tokyo University of Agriculture and Technology)

“Phase-field modelling and Bayesian data assimilation in materials science”

柴沼一樹（東京大学）， Kazuki Shibamura (The University of Tokyo)

“Fatigue life prediction based on multiscale model synthesis”

11:30-13:00 Lunch Break

13:00-15:00

垂水竜一（大阪大学）， Ryuichi Tarumi (Osaka University)

“Geometrization of solid mechanics”

梅野宜崇（東京大学）， Yoshitaka Umeno (The University of Tokyo)

“Multiscale modeling and simulation of fracture in polymers”

吉本勇太（東京大学）， Yuta Yoshimoto (The University of Tokyo)

“Relating microscopic morphology to mechanical properties of polymer composites for bulk heterojunction solar cells”

花崎逸雄（東京農工大学）， Itsuo Hanasaki (Tokyo University of Agriculture and Technology)

“Applied statistical mechanics for micro/nano engineering science”

宮路智行（京都大学）， Tomoyuki Miyaji (Kyoto University)

“A billiard problem of a self-propelling particle”

井上剛志（名古屋大学）， Tsuyoshi Inoue (Nagoya University)

“Vibration diagnostics of rotor crack using periodic excitation and nonlinear vibration analysis”

15:00-15:20 Break

15:20-16:20

鮎澤光（産業技術総合研究所）， Ko Ayusawa (AIST)

“Motion Optimization Framework of Humanoid Systems toward Human Ergonomic Analysis”

船戸徹郎（電気通信大学）， Tetsuro Funato (University of Electro-Communication)

“Approaching neural control structure through experiment and modeling of animal movement”

青井伸也（京都大学）， Shinya Aoi (Kyoto University)

“Improving turning maneuver of a multilegged robot using pitchfork bifurcation”

16:20-17:00 Chair: Shu Takagi

Discussion and Summary