2021 UNISOKU NEWSLETTER

Let the global
pandemic
be blown out!

Business Policy 経営方針

President and CEO Yutaka Miyatake

UNISOKU Co., Ltd. was founded by Dr. Toshihiko Nagamura in 1974 with the spirit of his frontier mentality, “Provide unique measurement systems to the society”. In 2010, we joined Tokyo Instruments(TII) Group, the worldwide trading group for advanced scientific instruments. Under the former President, Shoji Suruga, UNISOKU promoted globalization and capital investment and succeeded in expanding our sales worldwide.

We keep listening to our customers, continuously improve our systems, and visit them until their systems work properly and positive outcomes are obtained. This is our basic policy to build a bond with our customers. We strive to develop unique instruments that can provide significant impacts and create new values in the society, and continue to grow in the constantly changing world. A variety of innovative measurement systems have been continuously produced from UNISOKU, including not only very low temperature/high magnetic field STM systems but also tip-enhanced Raman spectroscopy systems possessing molecule-scale spatial resolution, cryogen-free STM systems, and optical instruments such as picoTAS, which enables us to measure over a wide range of time scales including “Gap Time Region” by utilizing our own RIPT method.

It is our mission and the origin of our growth to listen to our customers and provide them happiness and invaluable experience by offering solutions to their problems with our skills and knowledge. We continue to challenge and never give up until our products meet the customers’ needs, and strive to further improve our products and service.

株式会社ユニソクは、1974年に初代社長である長村俊彦氏の「ユニークな測定器を世の中に提供していく」というチャレンジ精神により誕生しました。2010年には、研究用計測機器の販売を行う株式会社東京インスツルメンツ(TII)のグループ会社となり、当時の同社社長、駿河正次氏を2代目社長として迎え、グローバル化と設備投資を進め、成長を遂げました。

弊社は、お客様の声に耳を傾け、改良を重ね、お客様の成果が出るまでお付き合いをさせていただくことを大切にしてきました。私たちは計測を通して社会に役立つオンリーワン、ナンバーワンの価値を生み出し、変化に強い会社として成長を続けることを目指しています。極低温強磁場STM装置の他にも、分子スケールの空間分解能を持つ探針増強ラマンSTM製品や、液体ヘリウムを使わない次世代無冷媒STM製品、分光製品では、従来法では困難だった時間領域を独自の計測技術(RIPT法)を用いて計測するピコ秒過渡吸収分光製品(picoTAS)などユニークな計測装置を次々と世に送り出しております。

お客様の声に耳を傾け、課題解決を知恵と工夫で提案することにより、感動と幸福を与え続けることが我々の使命であり成長の源であると考えます。これからも満足していただけるまであきらめない姿勢で挑戦を続け、より良い製品とサービスの提供に取り組んでまいります。

Our Policy for Delivery and Repair Visit Work due to COVID-19 COVID-19の世界的感染に伴う納品・修理訪問の方針

Due to the pandemic COVID-19, we sincerely apologize for any late deliveries and suspending our on-site visit work. Regarding restarting our on-site visit work, UNISOKU must follow the immigration policy announced by the Government of Japan for each country. Although it is difficult to restart traveling abroad depending on area, we do our best to keep this inconvenience to a minimum by offering online support and/or local support by the SPECS-TII group. We deeply appreciate your kind understanding in this regard. We are also grateful to our suppliers for their efforts to provide us products and keep their production lines running during this difficult situation.

COVID-19の世界的感染拡大により、納品の遅れやお客様への訪問サービスの提供が滞っておりますことを心よりお詫び申し上げます。弊社からの出張の再開に関しましては、日本政府による各国ごとの渡航安全基準と渡航先の入国基準に従う方針です。地域によっては渡航の再開は困難な状況ですが、オンラインサポートの提案、SPECS-TIIグループによるローカルサポートの活用など、お客様のご不便を低減するよう努力してまいります。これまでご理解をくださいましてありがとうございます。また弊社へのサプライヤーの皆様におかれましては生産能力の確保が厳しい中、弊社への製品提供にご尽力くださり感謝いたします。

SPECS-TII Group SPECS-TIIグループ

UNISOKU joined TII group as a subsidiary company in 2010. In 2017, TII Group and SPECS GmbH established a joint company, SPECS-TII GmbH in Switzerland, for strengthening their worldwide sales and support. SPECS-TII GmbH then established local firms in China, Russia and the United States for sales and support in those areas. UNISOKU and SPECS-TII aim to provide further reassurance and service for our customers using our global network.

ユニソクは2010年に株式会社東京インスツルメンツの子会社としてTIIグループに加わりました。TIIグループはドイツSPECS GmbHとともに両社の製品の販売とサポートを世界的に協力する目的で2017年にホールディングカンパニー SPECS-TII GmbHをスイスに設立しました。SPECS-TII GmbHは、販売とサービスの拠点として中国、ロシア、米国に現地法人を立ち上げました。ユニソクはSPECS-TIIのグローバル連携のネットワークを使い、お客様へのさらなる安心とサービスの提供を目指してまいります。

Corporate Philosophy 経営理念

UNISOKU contributes to the development of science and technology by providing customers with measurement systems that meet their exploring minds.

お客様の探究心に応える計測を提供し、お客様の成果を通じて、科学技術の発展に貢献する。

The Code of Conduct 行動指針

Challenge courageously
Even in difficult situations, we try something new with our strong will.

果敢に挑戦
困難なことでも強い意志を持って果敢に挑戦することを目指します。

Think positively and look from others’ standpoints
We express our gratitude. We achieve goals through mutual cooperation. We think from the standpoints of customers, partners and colleagues, and provide value for them.

物事を前向きに、相手の立場で考える
感謝の気持ちを示し、互いに協力しながら目標を達成することを目指します。
顧客・取引先・同僚の視点で考え、相手にとって価値あることの提供を目指します。

Create values
To meet ever-changing social needs, we aim to create values that provide happiness and impressive experience to customers by our knowledge and skills.

価値の創造
常に変化する世の中のニーズに応え、知恵と工夫で、幸福と感動を与える価値を創造することを目指します。

Pursue happiness
We work to share happiness with our customers and colleagues.

幸福の追求
仕事を通じて、顧客や同僚とともに歩み、分かち合える幸福を見つけることを目指します。

COMPANY PROFILE 会社概要

TRADE NAME（商号）	UNISOKU CO., LTD.（株式会社ユニソク）
CEO（代表取締役社長）	Yutaka Miyatake（宮武　優）
FOUNDATION（設立）	NOV. 1974（昭和 49 年 11 月）
LOCATION（所在地）	2-4-3 Kasugano, Hirakata, Osaka, Japan（大阪府枚方市春日野 2 丁目 4 番 3 号）
CAPITAL（資本金）	50,000,000 JPY（5,000 万円）
BUSINESS（事業）	Manufacturing and sales of our own UHV LT SPMs and Optical spectroscopy systems, research and development（走査型プローブ顕微鏡、高速分光装置製造販売「研究開発分野」にて事業）
MEMBERS（社員数）	49（49 名）

Events in 2020

1月 JAN

UNISOKU STM was introduced in "Doraemon Science World @ Future Life".
ユニソクSTM装置が、小学館発行「ドラえもん科学ワールド 未来のくらし」に掲載

UNISOKU received the 1st order of Liquid-He-Free UHV LT SPM system (End-user: Shanghai Jiao Tong University, China).
無冷媒低温SPMをはじめて受注（エンドユーザー：中国・上海交通大学）

1月 JAN

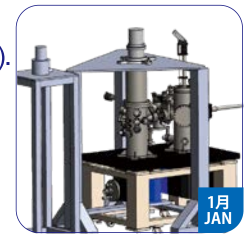
2月 FEB

2nd fluorescence lifetime option for picoTAS was delivered to Osaka University.
picoTAS用蛍光寿命オプション2台納品　46期2/2台目 (阪大)

3月 MAR

The RIPT method development in JST-SENTAN program received an S grade (the highest evaluation).
JST先端計測(RIPT法開発)でS評価獲得

UNISOKU delivered Room Temperature THz-SNOM system to Fudan University (through TII).
復旦大学(TII経由)常温THz-SNOMシステムを出荷


1月 JAN

4月 APR

UNISOKU started teleworking for the first time due to COVID-19.
コロナウィルス感染防止対策で初めてテレワークを導入

Our own helium liquefier system started operation.
社内ヘリウム液化装置稼働開始

6月 JUN

TSP2000 as the first optical system in China was delivered (Fudan University).
中国には初めての分光システム納入となるTSP2000を出荷（復旦大学）

9月 SEP

UNISOKU attended the 81st JSAP Autumn Meeting 2020 (online).
第81回応用物理学会秋季学術講演会 付設展示会（オンライン開催）

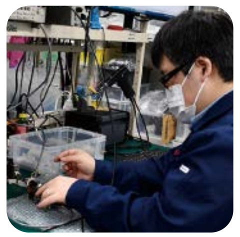
UNISOKU attended the Japanese Photochemistry Association 2020 (online).
2020年web光化学討論会（オンライン開催）

UNISOKU attended the 70th Japan Society of Coordination Chemistry (JSCC) online conference.
錯体化学会第70回討論会（オンライン開催）

President Yutaka Miyatake gave an invited talk, "Development of domestically-produced extreme environmental STM/AFM systems" at Nanoprobe Technology 167 committee (online).
ナノプローブテクノロジー第167委員会（オンライン開催）にて弊社代表 宮武 優が「国産極限環境STM/AFMの開発」を講演

10月 OCT

The 1st scanning microwave impedance microscope (sMIM) jointly developed with PrimeNano was delivered.
米国プライムナノ社と共同開発した走査マイクロ波インピーダンス顕微鏡1号機出荷



11月 NOV

The Japan Society of Vacuum and Surface Science academic seminar/digital exhibition (online) President Yutaka Miyatake delivered a lecture. "Developments of Low Temperature STM and surrounding technologies".
2020年日本表面真空学会 学術講演会 併設デジタル展示会（オンライン開催）　※新企画 実用新技術セミナーのプログラム内で弊社代表 宮武 優が講演を行う。表題：「低温STMと周辺技術に関する開発の紹介」

12月 DEC

28th International Colloquium on Scanning Probe Microscopy (ICSPM28) (online) Takehiro Ozawa of sales department gave a presentation about UNISOKU.
第28回走査型プローブ顕微鏡に関する国際コロキュウム(ICSPM28)・第34回 特別研究会「走査型プローブ顕微鏡」（オンライン開催）　※弊社営業部の小澤太健展が企業発表行う。

New Faces 新入社員紹介

New members have joined UNISOKU in 2020-21.　2020-21年 新しいメンバーが加わりました。

Production Division

生産課

We decided to hire him as a full-time employee from a contractual worker because we recognize his sincere attitude and speed to learn a new job. We expect him to have more experience in production and contribute to the production of high quality systems.

半年間の派遣会社からの就業を通し、仕事に真摯に取り組む姿勢と習得の早さを評価して採用しました。生産・組立の経験を積み、質の高い製品を作り上げることを期待しています。

Design Division

設計課

His experience in mechanical design is attractive for us. We expect him to understand mechanical structures of UNISOKU products and become a designer who can propose appropriate designs to our customers in the future.

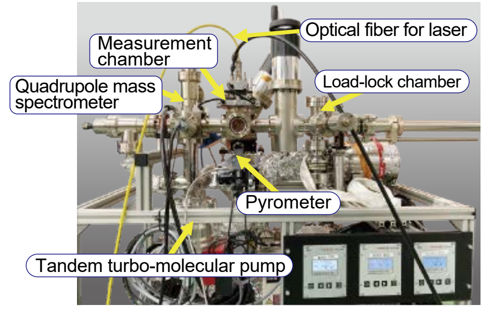
機械機器の設計の経験に魅力を感じ、採用しました。まずはユニソクの製品の機構を理解し経験を重ね、ユーザーの希望の機能を発現する適切な構造を提案できるような設計者になることを期待しています。

Product Development News in 2020

2020年 製品開発 ニュース

Highly Hydrogen-Sensitive Thermal Desorption Spectroscopy (TDS) System

高感度水素TDS(昇温脱離ガス分析法)システム



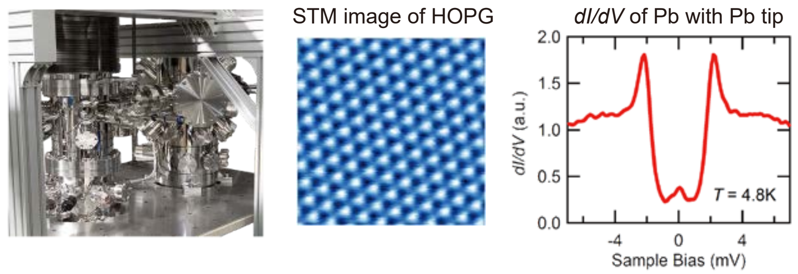
~10^3 higher sensitivity to hydrogen than other commercial TDS systems

Arbitrary heating rate between 10-100℃/min for 150-1000℃

This work was in collaboration with Prof. Hosono's group (Tokyo Institute of Technology) and supported by Ichimura Foundation for New Technology.

Cryogen-Free STM (USM1800)

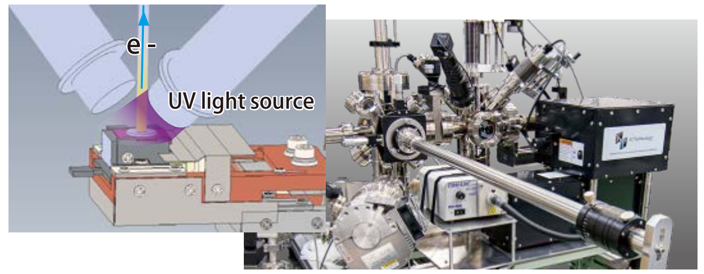
無冷媒STM



- Base temperature below T_{sample} = 5 K
- Low vibration noise level realized by our original design

UHV Kelvin Probe/Photoemission Spectroscopy System

超高真空ケルビンプローブ・光電子分光システム



- Kelvin probe by KP Technology Ltd.
- Sample transfer & exchange in UHV conditions
- Variable sample temperature

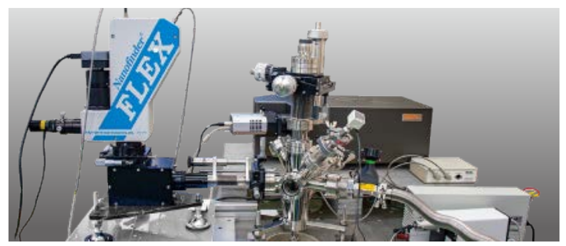
Applications

In-situ work function & surface potential measurements for thin films and clean surfaces prepared in vacuum

Distributor : Tokyo Instruments, Inc.

Raman Spectroscopy System for Thin Films Under Various Environmental Conditions

環境制御型 薄膜ラマン分光システム



Where to deliver :
Japan Atomic Energy Agency　Dr. Terasawa Tomo-o

Combination with Nanofinder® by Tokyo Instruments, Inc.

- Sample transfer & exchange in UHV conditions
- Raman spectroscopy measurements under gaseous/heating environments

Applications

- Thin films grown by CVD/MBE
- Variable temperature measurements
- Surface-adsorbed molecules at low temperatures

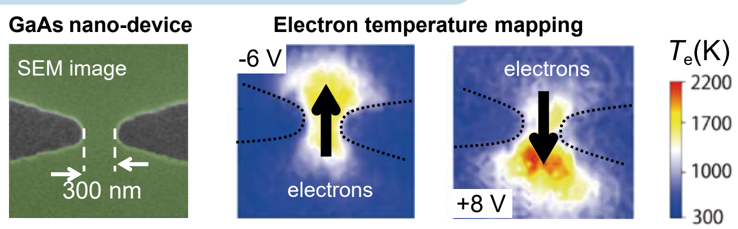
Hall Effect Measurement System for the Autonomous Synthesis System

ホール効果測定装置システム

Designed for automatic Hall effect measurements and sample transfer by a robot arm

This work was in collaboration with Prof. Hitosugi's group (Tokyo Institute of Technology) and MI-6 Ltd. as a part of their NEDO project.

Scanning Noise Microscope (SNoiM)



Real-space imaging of electron temperature with nanometer-scale spatial resolution

Q. Weng *et al.* Science **360**, 775 (2018).

This work is in collaboration with Dr.s Weng and Komiyama (Kim group in RIKEN).

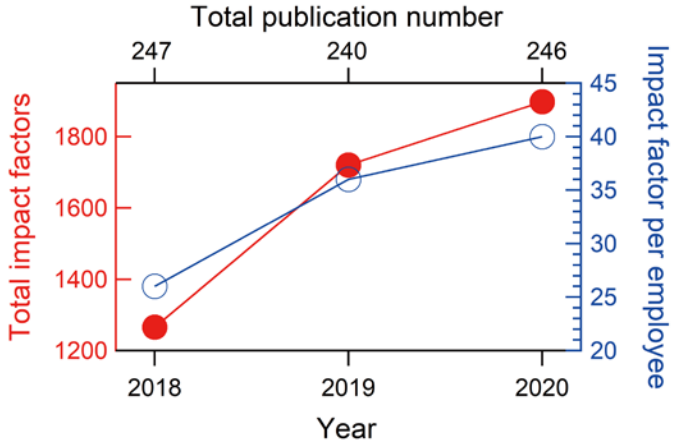
Introduction of Products / Users / Publications 製品・ユーザー・論文の紹介

Publication Stats in 2020

Total number of publications using UNISOKU systems* = 246 (240 in 2019)
Total impact factors ~ 1898 (1720 in 2019)
Corresponding to 44 Nature papers (40 in 2019)
Impact factor per employee ~ 40 (~36 in 2019)
Approaching to the impact factor of Nature (~43)

The detailed information about the publication list is available on our website.
*including preprints

Popular Research Fields	Num. of Publications	Average Impact Factor
Molecules	32	7.97
Topological Materials (Majorana)	31	15.77
Graphene (Twisted Bi-layer Graphene)	25	8.48
Transition Metal Dichalcogenides (TMDs)	21	10.69
Low Dimensional Structures (Nanowire, Low Dimensional Superconductivity, etc)	21	7.28
RIPT Transient Absorption	13	8.17
Monatomic Films excluding TMDs	10	10.18
Fe-based Superconductors (FeSe/STO)	9	12.50



USM1200 超高真空低温走査型プローブ顕微鏡システム
Ultra High Vacuum Low Temperature SPM System

Solution for long-term measurements with low cost cryogen

Application fields: molecules, transition metal dichalcogenides, low-dimensional structures

USM1200 Publication List in 2020 (Selected) 論文リスト

"Reconfigurable Photo-Induced Doping of Two-Dimensional Van Der Waals Semiconductors Using Different Photon Energies"
S. Seo *et al*. Nat. Electron. **4**, 38 (2021).

"Synthesis of Monolayer Blue Phosphorus Enabled by Silicon Intercalation"
J. L. Zhang *et al.*, ACS Nano **14**, 3687 (2020).

"Steering Effect of Bromine on Intermolecular Dehydrogenation Coupling of Poly(p-phenylene) on Cu(111)"
Y. Lin *et al.*, ACS Nano **14**, 17134 (2020).

"Orbital-Selective Dirac Fermions and Extremely Flat Bands in Frustrated Kagome-Lattice Metal CoSn"
Z. Liu *et al.*, Nat. Commun. **11**, 4002 (2020).

"On-surface Synthesis of Nitrogen Substituted Gold-Phosphorus Porous Network"
J. Zhang *et al.*, Chem. Mater. **32**, 8561 (2020).

"Molecular-Scale Investigation of the Thermal and Chemical Stability of Monolayer PTCDA on Cu(111) and Cu(110)"
C. Gu *et al.*, ACS Appl. Mater. Interfaces **12**, 22327 (2020).

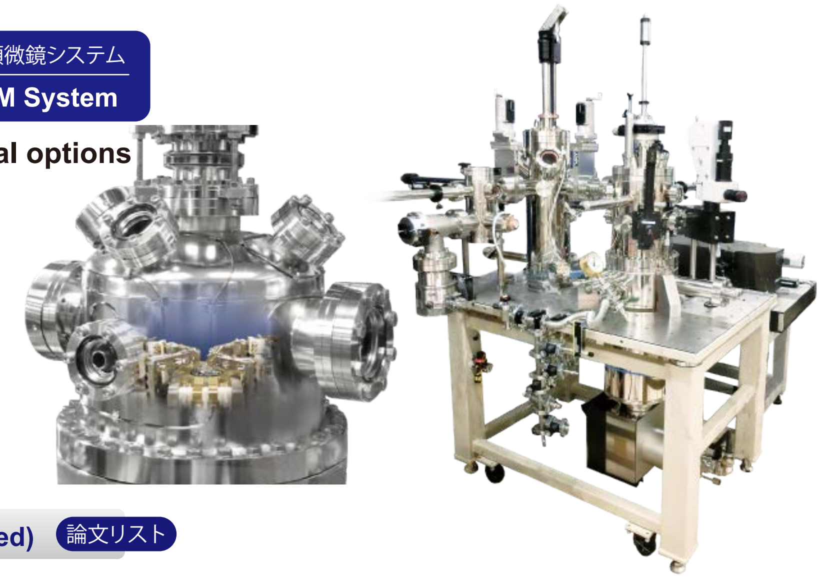
"Single-Molecule Imaging of Dinitrogen Molecule Adsorption on Individual Iron Phthalocyanine"
C. Gu *et al.*, Nano Res. **13**, 2393 (2020).

"Realization of a Buckled Antimonene Monolayer on Ag(111) via Surface Engineering"
S. Sun *et al*. J. Phys. Chem. Lett. **11**, 8976 (2020).

USM1400 超高真空低温走査型プローブ顕微鏡システム
Ultra High Vacuum Low Temperature SPM System

Ideal system for combining SPM with optical options and extending to a multi-probe platform

Application fields:
graphene, tip-enhanced Raman spectroscopy, scanning tunneling potentiometry, etc.



USM1400 Publication List in 2020 (Selected) 論文リスト

"Sub-Nanometre Resolution in Single-Molecule Photoluminescence Imaging"
B. Yang *et al.*, Nat. Photonics **14**, 693 (2020).

"Reversible Superconductor–Insulator Transition in (Li, Fe)OHFeSe Flakes Visualized by Gate-Tunable Scanning Tunneling Spectroscopy"
R. Yin *et al.*, ACS Nano **14**, 7513 (2020).

"Experimental Realization of Two-Dimensional Buckled Lieb Lattice"
H. Feng *et al.*, Nano Lett. **20**, 2537 (2020).

"Dramatic Enhancement of Tip-Enhanced Raman Scattering Mediated by Atomic Point Contact Formation"
S. Liu *et al.*, Nano. Lett. **20**, 5879 (2020).

"Interfacial Superconductivity in FeSe Ultrathin Films on $SrTiO_3$ Probed by In Situ Independently Driven Four-Point-Probe Measurements"
A. K. Pedersen *et al.*, Phys. Rev. Lett. **124**, 227002 (2020).

"Tunable Lattice Reconstruction, Triangular Network of Chiral One-Dimensional States, and Bandwidth of Flat Bands in Magic Angle Twisted Bilayer Graphene"
Y. Liu *et al.*, Phys. Rev. Lett. **125**, 236102 (2020).

"The Structure and Mechanism of Large-Scale Indium-Intercalated Graphene Transferred from SiC Buffer Layer"
T. Hu *et al.*, Carbon **171**, 829 (2021).

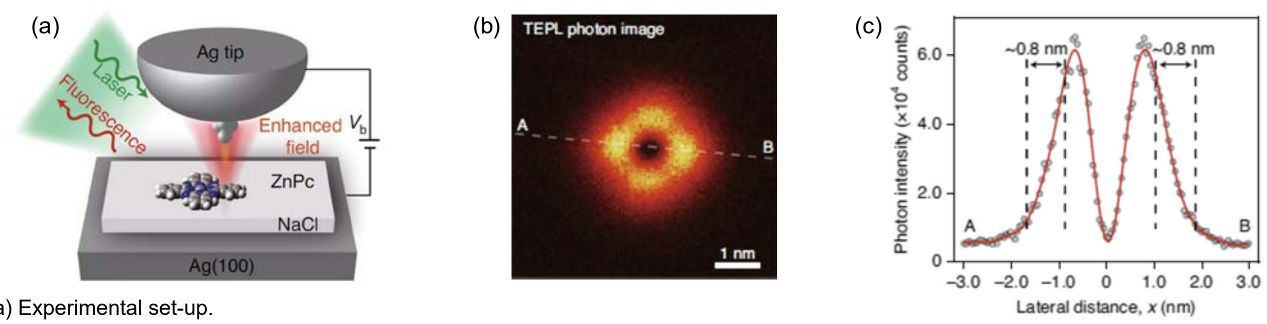
"Phase-Resolved Detection of Ultrabroadband THz Pulses Inside a Scanning Tunneling Microscope Junction"
M. Muller *et al.*, ACS Photonics **7**, 2046 (2020).

"Tunable Magnetism of a Single-Carbon Vacancy in Graphene"
Y. Zhang *et al.*, Sci. Bull. **65**, 194 (2020).

"Anisotropic Gapping of Topological Weyl Rings in the Charge-Density-Wave Superconductor In_xTaSe_2"
Y. Li *et al.*, Sci. Bull. DOI: 10.1016/j.scib.2020.09.007

"Sub-Nanometre Resolution in Single-Molecule Photoluminescence Imaging"
B. Yang *et al.*, Nat. Photonics, **14**, 693 (2020). Product used: USM1400

Sub-nanometer resolution imaging with scanning near-field optical microscopy (SNOM) has long been a challenge. Yang *et al.* (Dong group, Univ. of Science and Technology of China) demonstrated spatially and spectrally resolved photoluminescence imaging of a single zinc phthalocyanine (ZnPc) molecule with a spatial resolution down to 0.8 nm. The unprecedented spatial resolution was achieved by (1) a strongly localized-and-enhanced plasmon field using a Ag tip with an atomistic protrusion on the apex, (2) a three-monolayer-thick NaCl dielectric spacer to electronically decouple the ZnPc molecule from a plasmonic substrate Ag(100), and (3) the precise control of the tip-sample tunneling junction with sub-nanometer scale. They revealed intriguing photophysics of molecular fluorescence enhancement and quenching, and subtle plasmon-molecule interactions at the sub-molecular level, providing a new way for optical imaging, spectroscopy and engineering of light-matter interactions at the sub-nanometer level.



(a) Experimental set-up.
(b) Tip-enhanced photoluminescence image of a single ZnPc molecule on NaCl/Ag(100).
(c) Line-profile along AB in (b), showing the spatial resolution of 0.8 nm.

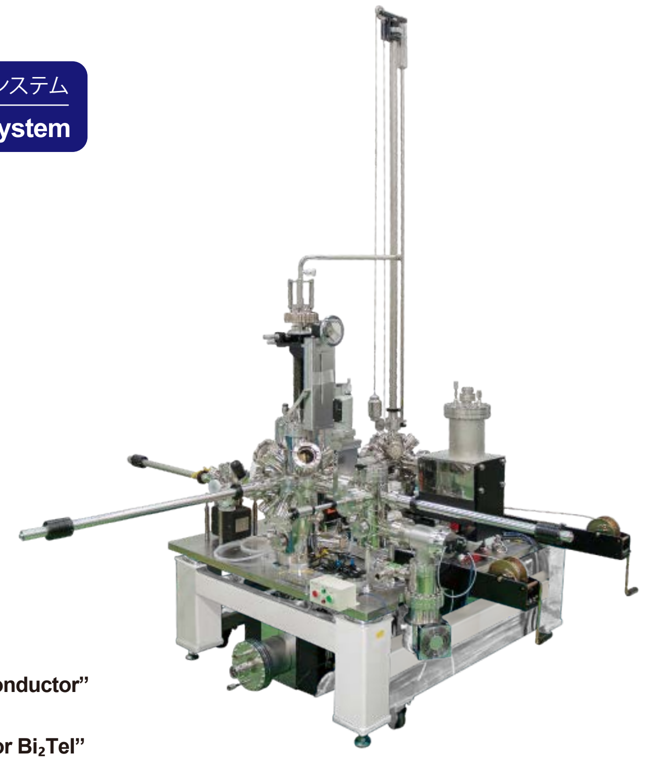
USM1300

超高真空極低温強磁場中走査型トンネル顕微鏡システム

Ultra High Vacuum Very Low Temperature High Magnetic Field SPM System

Best-selling very low temperature SPM system

Application fields: topological matters (Majorana), twisted bi-layer graphene, monolayer superconductors etc.



USM1300 Publication List in 2020 (Selected) 論文リスト

"Chiral Superconductivity in Heavy-Fermion Metal UTe_2"
L. Jiao *et al.*, Nature **579**, 523 (2020).

"Quantum-Limit Chern Topological Magnetism in $TbMn_6Sn_6$"
J. Yin *et al.*, Nature **583**, 533 (2020).

"Topological Superconductivity in a Van Der Waals Heterostructure"
S. Kezilebieke *et al.*, Nature **588**, 424 (2020).

"Evidence for Dispersing 1D Majorana Channels in an Iron-Based superconductor"
Z. Wang *et al.*, Science **367**, 104 (2020).

"Nearly Quantized Conductance Plateau of Vortex Zero Mode in an Iron-Based Superconductor"
S. Zhu *et al.*, Science **367**, 189 (2020).

"Visualizing Coexisting Surface States in the Weak and Crystalline Topological Insulator Bi_2TeI"
N. Avraham *et al.*, Nat. Mater. **19**, 610 (2020).

"Topological Frustration Induces Unconventional Magnetism in a Nanographene"
S. Mishra *et al.*, Nat. Nanotechnol. **15**, 22 (2020).

"Superhigh Uniform Magnetic Cr Substitution in a 2D Mo_2C Superconductor for a Macroscopic-Scale Kondo Effect"
C. Xu *et al.*, Adv. Mater. DOI: 10.1002/adma.202002825

"Epitaxial Growth of Single-Phase 1T'-WSe_2 Monolayer with Assistance of Enhanced Interface Interaction"
W. Chen *et al.* Adv. Mater. DOI: 10.1002/adma.202004930

"Interfacial Hydrogen-Bonding Dynamics in Surface-Facilitated Dehydrogenation of Water on TiO_2(110)"
S. Tan *et al.*, J. Am. Chem. Soc. **142**, 826 (2020).

"Proximity-Induced Superconductivity in Monolayer MoS_2"
D. J. Trainer *et al.*, ACS Nano **14**, 2718 (2020).

"Direct Observation of One-Dimensional Peierls-type Charge Density Wave in Twin Boundaries of Monolayer $MoTe_2$"
L. Wang *et al.*, ACS Nano **14**, 8299 (2020).

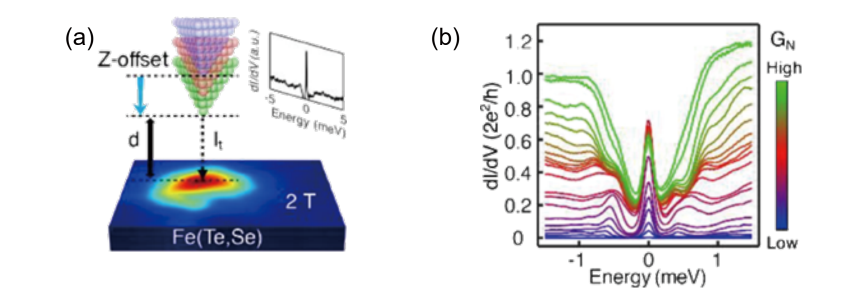
"An Anomalous Magneto-Optic Effect in Epitaxial Indium Selenide Layers"
W. Fu *et al.*, Nano Lett. **20**, 5330 (2020).

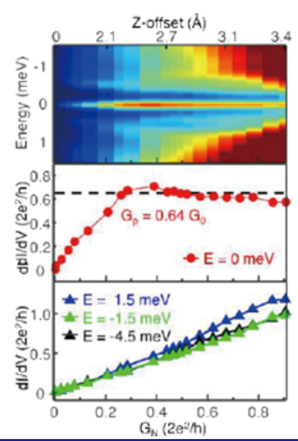
"Relativistic Artificial Molecules Realized by Two Coupled Graphene Quantum Dots"
Z. Fu *et al.*, Nano Lett. **20**, 6738 (2020).

"Nearly Quantized Conductance Plateau of Vortex Zero Mode in an Iron-Based Superconductor"

S. Zhu, L. Kong, L. Cao, H. Chen *et al.*, Science **367**, 189 (2020). Product used: USM1300

The search for topological superconductors has been recently one of central issues in the condensed matter physics. In a vortex core of the topological superconductor, Majorana bound states are predicted to exist at zero energy and obey Non-Abelian statistics, offering potential applications in topological quantum computation. However, experimental demonstrations have remained challenging. Zhu *et al.* (Gao group, Chinese Academy of Sciences) performed variable-tunnel-coupled STS measurements at T_{eff} = 377 mK on vortex cores in $FeTe_{0.55}Se_{0.45}$, a strong candidate for the topological superconductor. They observed nearly quantized conductance plateaus as a function of tunnel coupling for zero-energy bound states, whereas no plateaus were observed on finite energy bound states originating from conventional quasipartcles. The plateau behavior of the zero-bias conductance is theoretically supported as spectroscopic evidence for the existence of Majorana bound states. Their study moves one step further toward the braiding operation in topological quantum computation.





(a) A variable tunnel coupling STM/STS for a vortex core of $FeTe_{0.55}Se_{0.45}$.
(b) *dI/dV* spectra taken at the vortex core as a function of the tunnel coupling (T_{eff} = 377 mK).
(c) (top) A color-scale plot of (b). (middle) Line-cut at V = 0 meV, showing a conductance plateau. (bottom) Line-cuts at high V values, showing the absence of the conductance plateau.

USM1300 Publication List in 2020 (Selected) 論文リスト

"Precise Tuning of Band Structures and Electron Correlations by van der Waals Stacking of One-Dimensional W_6Te_6 Wires"
J. Deng *et al.*, Nano Lett. **20**, 8866 (2020).

"Mottness Versus Unit-Cell Doubling as the Driver of the Insulating State in 1T-TaS_2"
C. J. Butler *et al.*, Nat. Commun. **11**, 2477 (2020).

"Molecular Molds for Regularizing Kondo States at Atom/Metal Interfaces"
X. Li *et al.*, Nat. Commun. **11**, 2566 (2020).

"Fermion-Boson Many-Body Interplay in a Frustrated Kagome Paramagnet"
J. Yin *et al.*, Nat. Commun. **11**, 4003 (2020).

"Spin-Orbit Quantum Impurity in a Topological Magnet"
J. Yin *et al.*, Nat. Commun. **11**, 4415 (2020).

"Long-Range Focusing of Magnetic Bound States in Superconducting Lanthanum"
H. Kim *et al.*, Nat. Commun. **11**, 4573 (2020).

"Imaging the Coupling Between Itinerant Electrons and Localised Moments in the Centrosymmetric Skyrmion Magnet $GdRu_2Si_2$"
Y. Yasui *et al.*, Nat. Commun. **11**, 5925 (2020).

"Single Particle Tunneling Spectrum of Superconducting $Nd_{1-x}Sr_xNiO_2$ Thin Films"
Q. Gu *et al.*, Nat. Commun. **11**, 6027 (2020).

"A New Majorana Platform in an Fe-As Bilayer Superconductor"
W. Liu *et al.*, Nat. Commun. **11**, 5688 (2020).

"Atomically Thin Superconductors"
Z. Li *et al.*, Small DOI: 10.1002/smll.201904788

"Valley Polarization and Inversion in Strained Graphene via Pseudo-Landau Levels, Valley Splitting of Real Landau Levels, and Confined States"
S. Li *et al.*, Phys. Rev. Lett. **124**, 106802 (2020).

"Movable Valley Switch Driven by Berry Phase in Bilayer-Graphene Resonators"
Y. Liu *et al.*, Phys. Rev. Lett. **124**, 166801 (2020).

"Many-Body Resonance in a Correlated Topological Kagome Antiferromagnet"
S. Zhang *et al.*, Phys. Rev. Lett. **125**, 046401 (2020).

"Strain Tunable Semimetal–Topological-Insulator Transition in Monolayer 1T′–WTe_2"
C. Zhao *et al.*, Phys. Rev. Lett. **125**, 046801 (2020).

"Direct Visualization of Ambipolar Mott Transition in Cuprate CuO_2 Planes"
Y. Zhong *et al.*, Phys. Rev. Lett. **125**, 077002 (2020).

"Local Berry Phase Signatures of Bilayer Graphene in Intervalley Quantum Interference"
Y. Zhang *et al.*, Phys. Rev. Lett. **125**, 116804 (2020).

"Multiple In-Gap States Induced by Topological Surface States in the Superconducting Topological Crystalline Insulator Heterostructure $Sn_{1-x}Pb_xTe$−Pb"
H. Yang *et al.*, Phys. Rev. Lett. **125**, 136802 (2020).

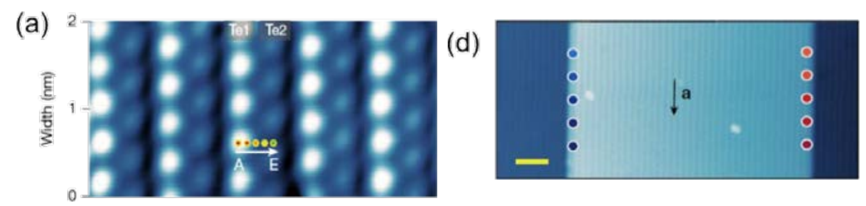
"Superconductivity in a Hole-Doped Mott-Insulating Triangular Adatom Layer on a Silicon Surface"
X. Wu *et al.*, Phys. Rev. Lett. **125**, 117001 (2020).

"Observation of Discrete Conventional Caroli–de Gennes–Matricon States in the Vortex Core of Single-Layer FeSe/$SrTiO_3$"
C. Chen *et al.* Phys. Rev. Lett. **124**, 097001 (2020).

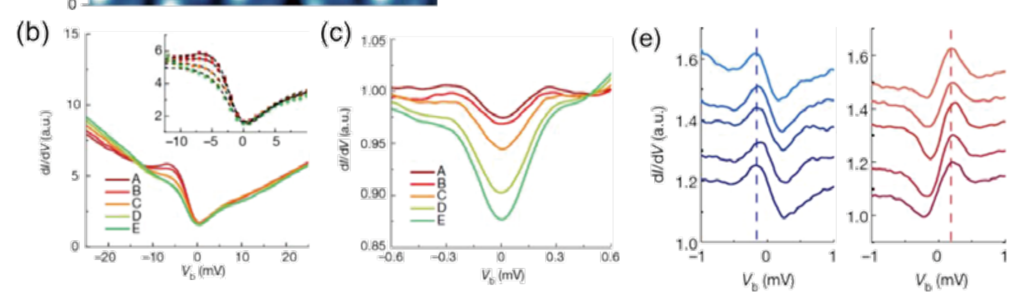
"Chiral Superconductivity in Heavy Fermion Metal UTe_2"

L. Jiao *et al.*, Nature **579**, 523 (2020). Product used: USM1300

Spin triplet superconductors consisting of electron pairs with spin 1 and an odd-parity wavefunction are topologically nontrivial and expected to provide an ideal platform for realizing Majorana edge states but extremely rare in solid state systems. Jiao *et al.* (Vidya Madhavan group, University of Illinois) performed STM measurements on the recently discovered heavy fermion superconductor UTe_2 (T_c = 1.6 K) and found clear signatures of competing Kondo effect and superconductivity within one unit cell. They also revealed 'chiral' in-gap states at step edges, which are theoretically predicted to exist at the boundaries of topological superconductors. Their result suggests that UTe_2 is a strong candidate for chiral triplet topological superconductivity.



(a) STM image of UTe_2.
(b,c) *dI/dV* spectra taken at the location denoted in (a), showing the Kondo resonance and the superconducting gap, respectively.
(d) STM image of UTe_2 with a terrace.
(e) *dI/dV* spectra measured at the step edge marked by dots in (d), showing the chiral in-gap states.



USM1500

超高真空低温強磁場中走査型プローブ顕微鏡システム

Ultra High Vacuum / Low Temperature / High Magnetic Field SPM System

Compact cryogenic high magnetic field SPM system

Application fields: monolayer films, topological matters, transition metal dichalcogenides etc.

USM1500 Publication List in 2020 (Selected) 論文リスト

"Packing Sierpiński Triangles Into Two-Dimensional Crystals"
Y. Zhang *et al.*, J. Am. Chem. Soc. **142**, 17928 (2020).

"Te-Vacancy Induced Surface Collapse and Reconstruction in Antiferromagnetic Topological Insulator $MnBi_2Te_4$"
F. Hou *et al.*, ACS Nano **14**, 11262 (2020).

"Kinetics-Limited Two-Step Growth of Van Der Waals Puckered Honeycomb Sb Monolayer"
Z. Shi *et al.*, ACS Nano **14**, 16755 (2020).

"Charge Density Modulation and the Luttinger Liquid State in $MoSe_2$ Mirror Twin Boundaries"
Y. Xia *et al.*, ACS Nano DOI: 10.1021/acsnano.0c05397

"Distinct Topological Surface States on the Two Terminations of $MnBi_4Te_7$"
X. Wu *et al.*, Phys. Rev. X **10**, 031013 (2020).

"Atomic-Scale Observation of Topological Vortices in the Incommensurate Charge Density Wave of 2H-$TaSe_2$"
S. Lim *et al.*, Nano Lett. **20**, 4801 (2020).

"Tuning the Electronic Structure of an α-Antimonene Monolayer Through Interface Engineering"
Z. Shi *et al.*, Nano Lett. **20**, 8408 (2020).

"Direct Observation of Full-Gap Superconductivity and Pseudogap in Two-Dimensional Fullerides"
M. Ren *et al.*, Phys. Rev. Lett. **124**, 187001 (2020).

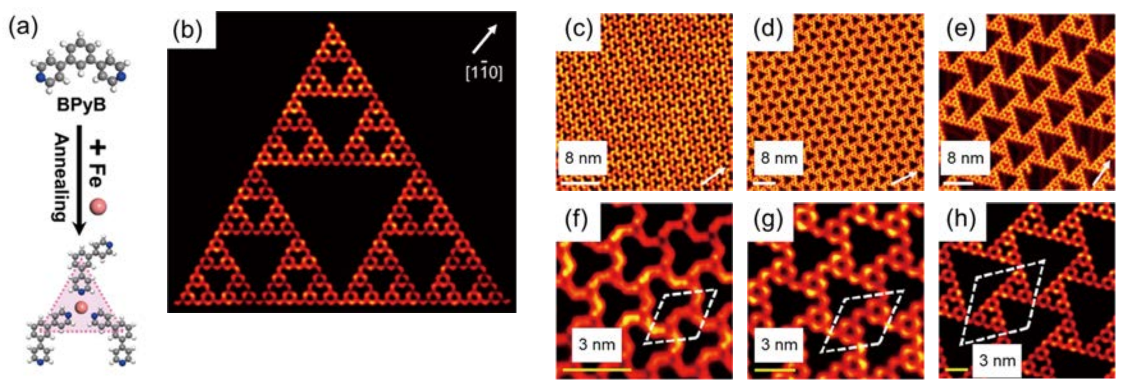
"Reversible Potassium Intercalation in Blue Phosphorene–Au Network Driven by an Electric Field"
Y. Liu *et al.*, J. Phys. Chem. Lett. **11**, 5584 (2020).

"Heterostructures of Tellurium on $NbSe_2$ from Sub-Monolayer to Few-Layer Films"
J. Xian *et al.*, Nanoscale **12**, 1994 (2020).

"Packing Sierpiński Triangles into Two-Dimensional Crystals"

Y. Zhang *et al.*, J. Am. Chem. Soc. **142**, 17928 (2020). Product used: USM1500

Two-dimensional (2D) fractal patterns such as the Sierpiński triangles (STs) are theoretically predicted to exhibit intriguing optical and electronic properties due to their aperiodic but ordered structures. However, realizing large-scale 2D crystals has remained challenging. Zhang *et al*. (Yongfeng Wang group, Peking Univ.) succeeded in constructing a series of 2D packed crystals of STs consisting of 1,3-bis (4-pyridyl) benzene (BPyB) molecules and Fe atoms on Au surfaces. Their STM characterization combined with theoretical calculations suggests that molecular free diffusion and structure matching between STs and Au play important roles in the construction of 2D crystal of STs.



(a) The ST unit consisting of three BPyB and one Fe atom. (b) STM image of a typical ST on Au(111).
(c-e) Large-scale STM image of 2D crystals of STs. The coverage is 1, 0.65 and 0.57 monolayer, respectively.
(f-h) Close-up STM image of (c-e), respectively.

USM1600

希釈冷凍方式超高真空超低温強磁場中走査型トンネル顕微鏡システム

Dilution-Refrigerator Based UHV/Ultra Low Temperature/High Magnetic Field STM System

Electron temperature ~110mK

Application fields: topological matters (Majorana), etc.

USM1600 Publication List in 2020 (Selected) 論文リスト

"Robust Hot Electron and Multiple Topological Insulator States in $PtBi_2$"
X. Nie *et al.*, ACS Nano **14**, 2366 (2020).

"Localized Spin-Orbit Polaron in Magnetic Weyl Semimetal $Co_3Sn_2S_2$"
Y. Xing *et al.*, Nat. Commun. **11**, 5613 (2020).

"A Tunable and Unidirectional One-Dimensional Electronic System $Nb_{2n+1}Si_nTe_{4n+2}$"
Z. Zhu *et al.*, npj Quantum. Mater. **5**, 35 (2020).

JT-SPM

ジュールトムソン方式超高真空極低温強磁場中走査型プローブ顕微鏡システム

Joule-Thomson Ultra High Vacuum Very Low Temperature High Magnetic Field SPM System

Low temperature/high magnetic field SPM with optical access
Technology taken over from SPECS. GmbH and improved and integrated with USM1200 series

Application fields: molecules, graphene, etc.

JT-SPM Publication List in 2020 (Selected) 論文リスト

"Resolving Quinoid Structure in Poly-Para-Phenylene Chains"
B. Yuan *et al.*, J. Am. Chem. Soc. **142**, 10034 (2020).

"Precise Control of π-Electron Magnetism in Metal-Free Porphyrins"
Y. Zhao *et al.*, J. Am. Chem. Soc. **142**, 18532 (2020).

"Atomically Precise Synthesis and Characterization of Heptauthrene with Triplet Ground State"
X. Su *et al.*, ACS Nano **20**, 6859 (2020).

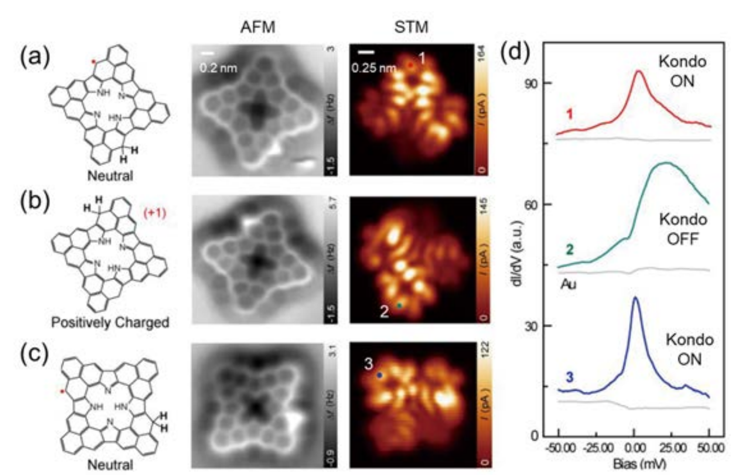
"Designer Spin Order in Diradical Nanographenes"
Y. Zheng *et al.*, Nat. Commun. **11**, 6076 (2020).

"Engineering of Magnetic Coupling in Nanographene"
Y. Zheng *et al.*, Phys. Rev. Lett. **124,** 147206 (2020).

"Precise Control of π-Electron Magnetism in Metal-Free Porphyrins"

Y. Zhao, K. Jiang *et al.*, J. Am. Chem. Soc. **43**, 18532 (2020). Product used: JT-SPM

Porphyrin is one of the most fundamental building blocks for functional molecular systems. The magnetism of localized spins in the center of the porphyrin has long been studied, but realizing delocalized spins in the porphyrin, which offer potentials for building correlated quantum spins, has remained elusive. Zhao *et al*. (Wang, Zhuang, Jia group, Shanghai Jiao Tong Univ.) revealed that metal-free porphyrins adsorbed on Au(111) host delocalized singlet π-electron spins using STM/AFM and theoretical calculations. The delocalized magnetism was precisely controlled by tailoring peripheral π-electron topology in metal-free porphyrins and reversely switched on/off via STM manipulation by tuning the interfacial charge transfer between the porphyrin and Au substrate. Their study provides an effective way to engineer π-magnetism induced by porphyrins, implying potential applications for organic-molecules-based quantum information and spintronics.



Magnetism switching experiment by STM manipulation.
(a-c) From left to right: chemical structure, nc-AFM image with a CO tip, constant-height STM image. (d) *dI/dV* spectra taken at the marked location in STM images.

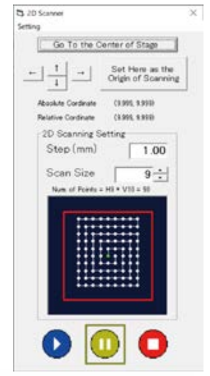
picoTAS

ピコ秒過渡吸収分光システム

Picosecond Transient Absorption Spectroscopy System

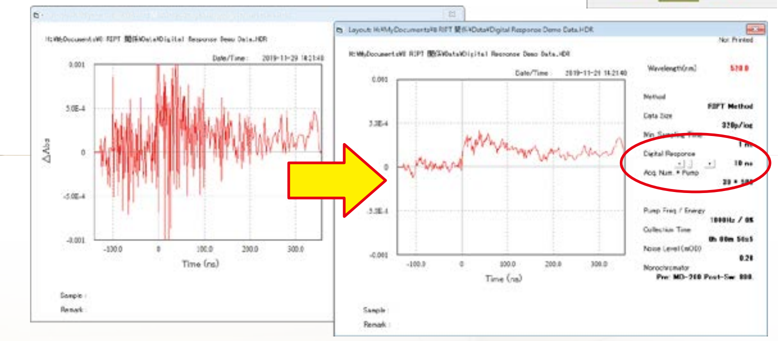
Original New Functions

- ✓ **TCSPC fluorescence lifetime**
- ✓ Digital response capability ***New***
- ✓ One-stroke scanner for thin film ***New***
- ✓ Pseudo-CW performance enhanced



Scanner software is incorporated in picoTAS

TCSPC option

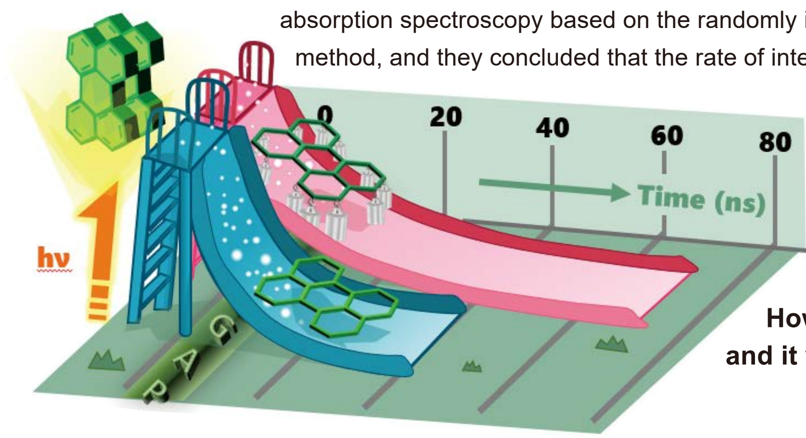


Digital response makes it easier to detect signal!

"Effect of Deuteration on Relaxation Dynamics of the Perylene Excimer Studied by Subnanosecond Transient Absorption Spectroscopy"

Y. Shibasaki, R. Katoh *et al.*, J. Phys. Chem. A **125**, 1359 (2021). Product used: picoTAS

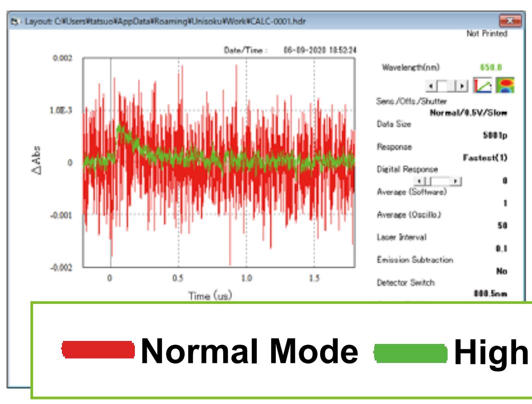
Prof. Katoh's group in Nihon University found that the deuterated perylene excimer in solution had a longer lifetime than the undeuterated excimer. They studied the effect of deuteration on the relaxation dynamics of the excimer of perylene in solution using subnanosecond time-resolved transient absorption spectroscopy based on the randomly interleaved pulse-train (RIPT) method, and they concluded that the rate of internal conversion was suppressed by deuteration. Such a fundamental finding has been overlooked because it had been difficult to perform systematic study for phenomena lying in nanosecond region by conventional techniques. **Prof. Katoh says, "This is actually a modest job. However, I believe that this is an important data and it would appear in textbooks in the future."**



TSP2000-HS

レーザーフラッシュフォトリシス装置

Conventional UV/VIS/NIR Flash Photolysis System



Significant improvement of sensitivity!

- ✓ Digital response capability ***New***
- ✓ Complete removal of Q-SW noise by pump-shutter ***New***
- ✓ High sensitivity achived by 5 Hz shutter, 12 bit oscilloscope and chopping mode ***New***

CoolSpeK UV/CD/IR

分光用クライオスタット

Cryostat for Spectrophotometer USP-203 Ser ies

- ✓ Total number of shipments of CoolSpeK since released > 450
- ✓ Wide input voltage available now. No transformer required ***New***
- ✓ Newly compatible with Cary 100 / 300 / Eclipse (Agilent Tech.), Spectrum Two (PerkinElmer) UH5700 (Hitachi)

Upcycled HP8453 by OLIS Inc. for CoolSpek is now available from us.

Helios-FIRE

Ultrafast SYSTEMS

Brand-new products by Ultrafast Systems, Helios/Eos-Fire installed in one of Japanese Institutes. (Jan. 2021)

- ✓ **Fully automated hands free design**
- ✓ **Microscope extension now available**
- ✓ **Broad probe spectral range, 320 - 2400 nm**

CPL Solo

We started to handle OLIS, Inc. (USA) products ***New***

- ✓ **Filtered LED sources**
- ✓ **Gated photon counting detector**
- ✓ **No need for G-factor corrections**
- ✓ **NIR model is now available**

Small, affordable, and fully digital circularly polarized luminescence

Ying-Shuang Fu

Huazhong University of Science and Technology, China

Research Interests

- Molecular beam epitaxy growth of low dimensional materials
- Electronic properties of topological states of matter
- Electronic properties of correlated states in low dimensional systems
- Spin-resolved spectroscopic imaging of magnetism in low dimensions

USM1300

0.4K-12T STM

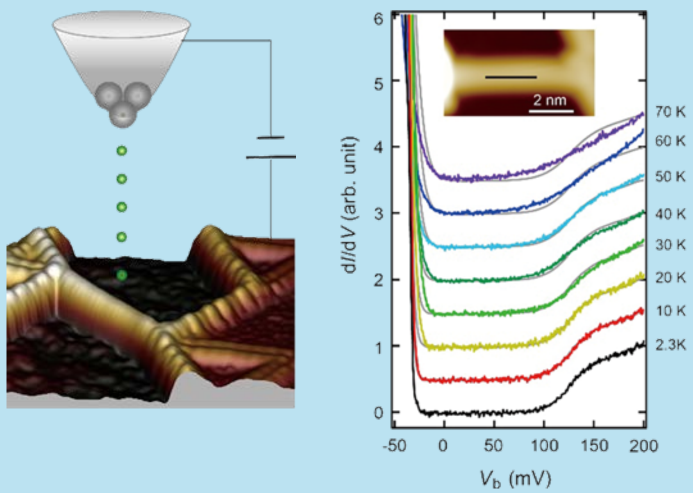
USM1500

2K-8T STM/AFM

USM1200

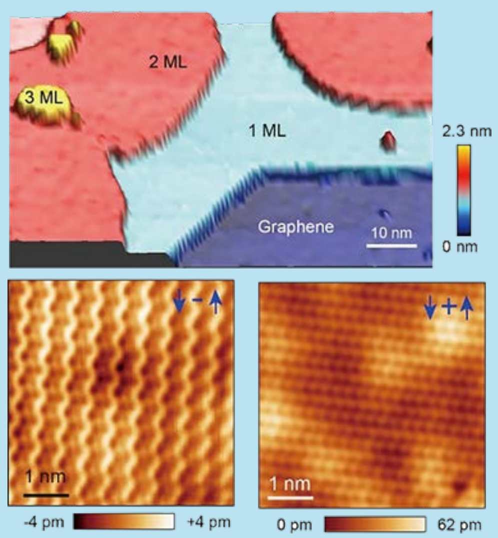
5K STM

Phason-Polaron Spectrum of Pure One-Dimensional Charge Density Wave in a Single Mo_6Se_6 Nanowire

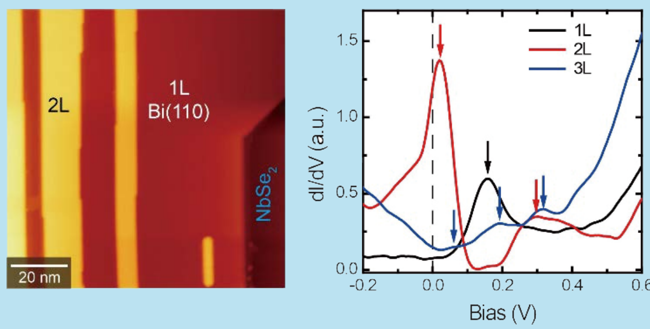


X. Yang, *et al*. Phys. Rev. X, **10**, 031061 (2020)

Spin Resolved Intrinsic Antiferromagnetic Order in a Van Der Waals Monolayer Crystal

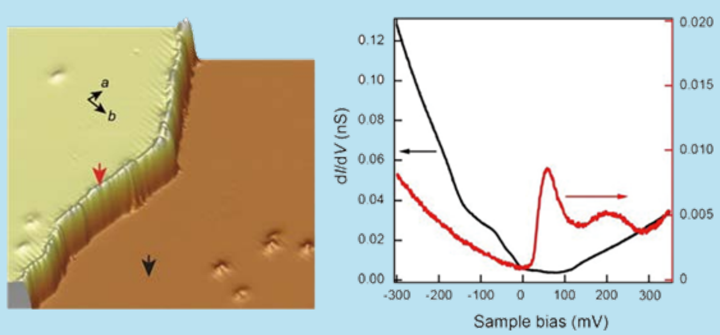


Electronic States of Bi Ultrathin Films Modulated by a $NbSe_2$ Substrate



L. Peng, *et al*., ACS Nano **13**, 1885 (2019).

Topological Edge State Residing at Step Edge of WTe_2



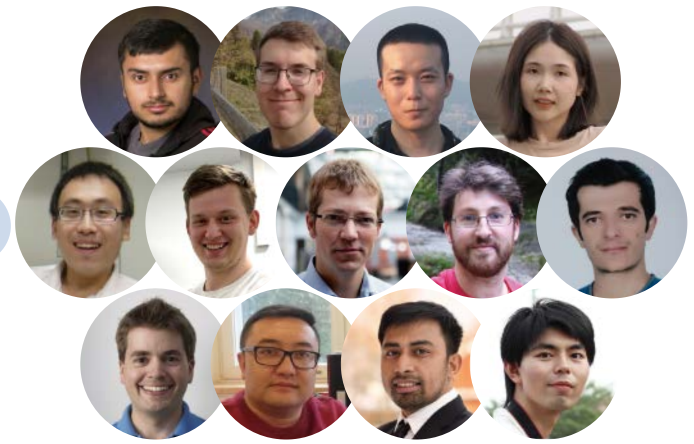
L. Peng, *et al*., Nat. Commun. **8**, 659 (2017).

Peter Liljeroth

Aalto University, Finland

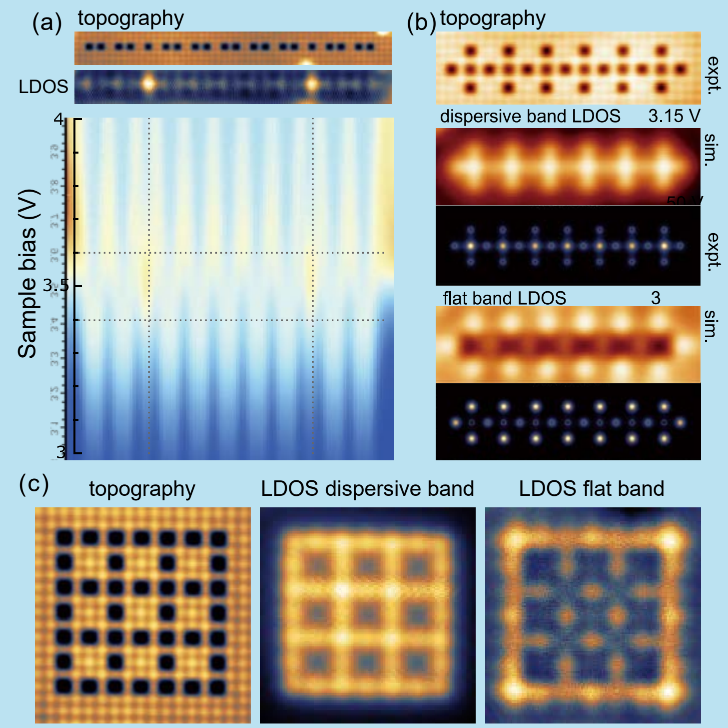
Research Interests

- Low-temperature scanning tunneling microscopy and spectroscopy
- Atomic force microscopy
- Two-dimensional materials, metal-organic frameworks
- On-surface synthesis
- Artificial lattices
- Designer quantum materials



Artificial Atomic Lattices

Examples of Artificial Lattices Constructed Using Chlorine Vacancies on Cu(100).

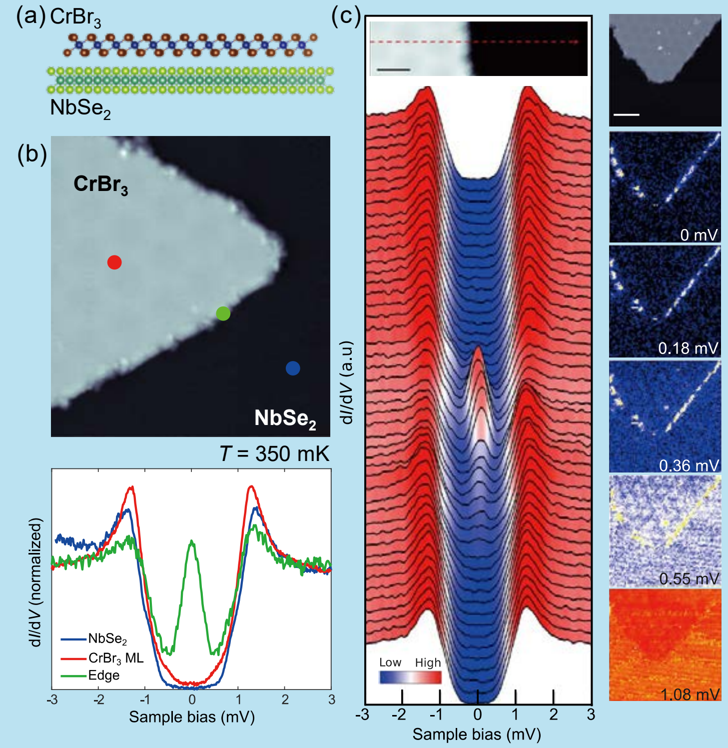


(a) STM topography, LDOS map and spatially resolved *dI/dV* spectroscopy on a dimer chain with two domain walls hosting topological mid-gap states. (b) STM topography (top) and the dispersive and flat band LDOS maps of a 1D cross chain. (c) Topography and LDOS maps of a Lieb lattice structure assembled from Cl vacancies.

Topological States in Engineered Atomic Lattices, R. Drost *et al.* Nat. Phys. **13**, 668 (2017).
Tuneable Topological Domain Wall States in Engineered Atomic Chains, Md N. Huda *et al.* npj Quant. Mater. **5**, 17 (2020).
Designer Flat Bands in Quasi-One-Dimensional Atomic Lattices, Md N. Huda *et al.* Phys. Rev. Res. **2**, 043426 (2020).

Topological Superconductivity in Van Der Waals Heterostructures

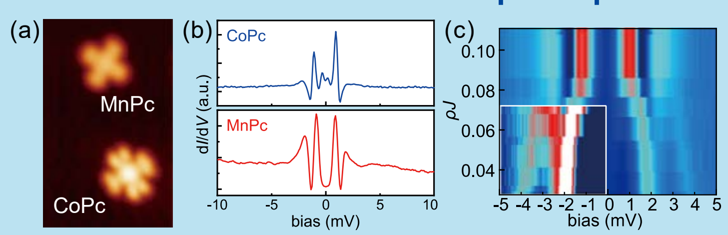
Topological Superconductivity in $CrBr_3$-$NbSe_2$ Heterostructures.



(a) Schematic of the heterostructure. (b) STM topography and *dI/dV* spectroscopy showing the presence of edge modes at the edges of the $CrBr_3$ monolayer. (c) Spatially resolved spectroscopy and LDOS maps of the Majorana zero modes.

Topological Superconductivity in a Van Der Waals Heterostructure, S. Kezilebieke *et al.* Nature **588**, 424 (2020).
Moiré-Enabled Topological Superconductivity, S. Kezilebieke *et al.* arXiv:2011.09760.

Yu-Shiba-Rusinov States and Spin-Flip Excitations in Molecular Systems



(a),(b) STM topography and *dI/dV* spectroscopy of MnPc and CoPc molecules.
(c) Tunneling conductance as a function of the exchange coupling ρJ showing the co-existence of YSR states and spin-flip excitations.

Coupled Yu-Shiba-Rusinov States in Molecular Dimers on $NbSe_2$, S. Kezilebieke *et al.* Nano Lett. **18**, 2311 (2018).
Observation of Coexistence of YSR States and Spin-Flip Excitations, S. Kezilebieke *et al.* Nano Lett. **19**, 4614 (2019).

Toru Hirahara

Tokyo Institute of Technology, Japan

Research Interests

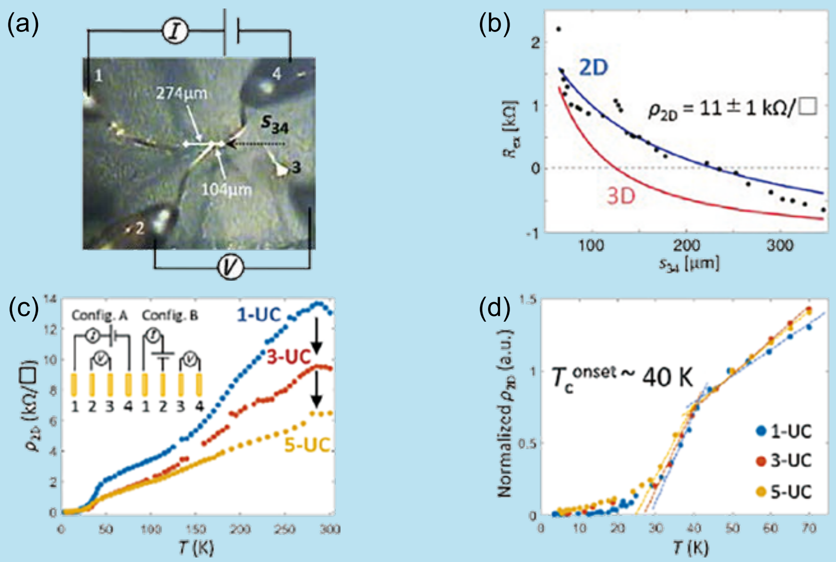
- Novel atomically thin 2D systems
- High-temperature superconductivity: FeSe/STO
- Magnetic topological insulators

Interfacial Superconductivity in FeSe Ultrathin Films on $SrTiO_3$ Probed by *In Situ* Independently Driven Four-Point-Probe Measurements

A. Pedersen *et al*., Phys. Rev. Lett. **124**, 227002 (2020).

USM1400

Photograph of the USM1400 system



(a) Photograph of the four probes. (b) Probe spacing dependence measurements to determine the conductivity dimension.
(c) Temperature dependence of the measured resistance for films with different thicknesses.
(d) Same as (c) but shown in normalized resistance to show the universal feature of the superconductivity onset at 40 K.

Superconductivity of Single Unit Cell FeSe/$SrTiO_3$(001): Substrate-Surface Superstructure Dependence

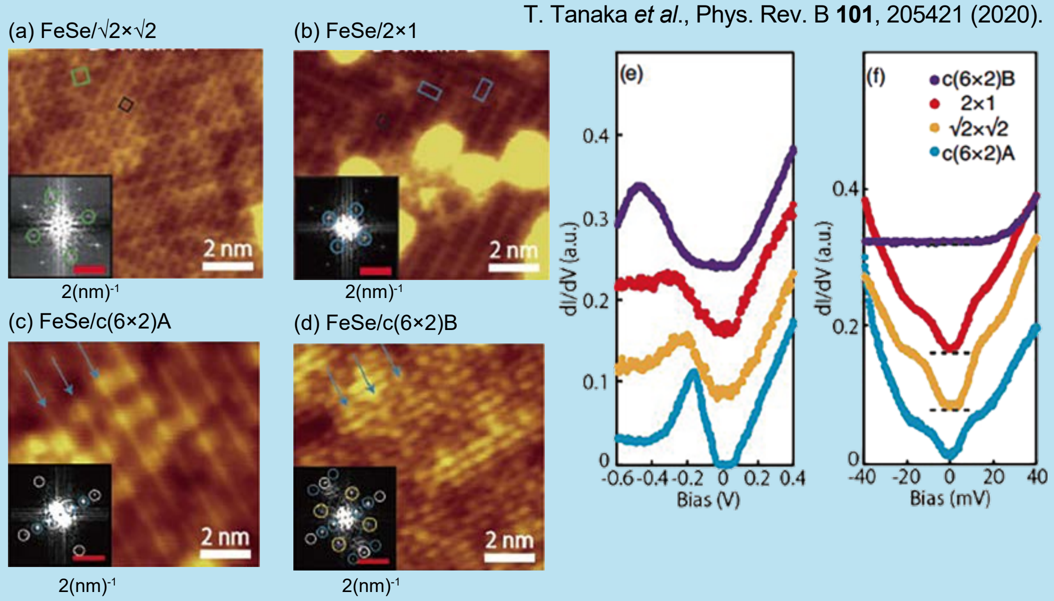
T. Tanaka *et al*., Phys. Rev. B **98**, 121410(R) (2018).

Superconducting Dome Revealed by Surface Structure Dependence in Single Unit Cell FeSe on $SrTiO_3$(001)

T. Tanaka *et al*., Phys. Rev. B **101**, 205421 (2020).

USM1500

Photograph of the USM1500 system with the load lock, sample preparation, and measurement chambers



(a)-(d) Atomically resolved image of the 1UC FeSe grown on different STO surface superstructures.
(e): *dI/dV* spectra taken on the 1UC FeSe grown on different STO surface superstructures.
(f) Same as (e) but those obtained near the Fermi level showing the superconducting gap.

Yi Du

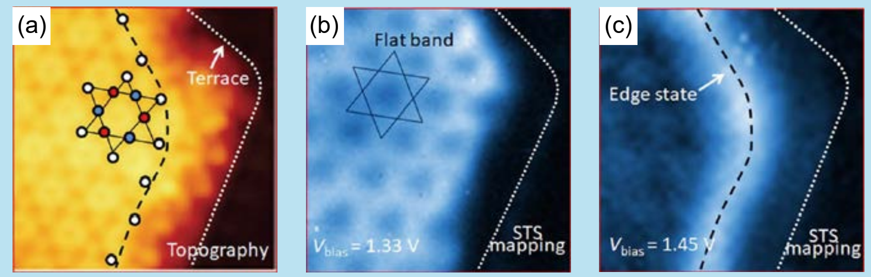
Australian Institute for Innovative Materials (AIIM)
The University of Wollongong, Australia

Research Interests

- Scanning tunneling microscopy
- 2D Xenes materials (silicene, germanene, stanene and blue phosphorene) and 2D frustrated lattice systems
- MBE growth of 2D device structures (photodetectors, sodium ion batteries, etc.)

STM Facilities in the Team

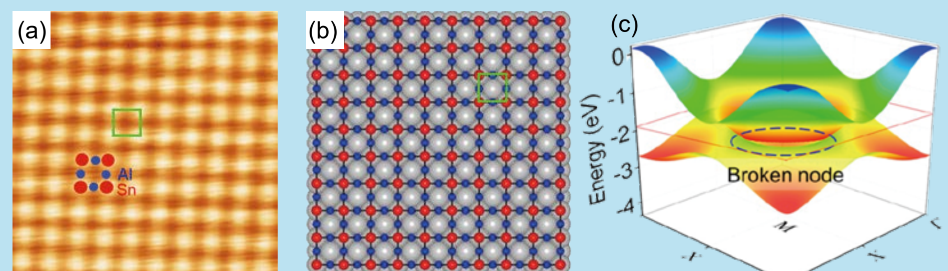
Realization of Flat Band with Possible Nontrivial Topology in Electronic Kagome Lattice



(a) STM image of the Kagome lattice on a twisted multilayered silicene on the Ag(111) substrate.
(b,c) STS image simultaneously obtained with (a) at the flat-band energy, showing the Kagome pattern and at the edge state energy, respectively.

Z. Li *et al*., Sci. Adv. **4**, eaau4511 (2018).

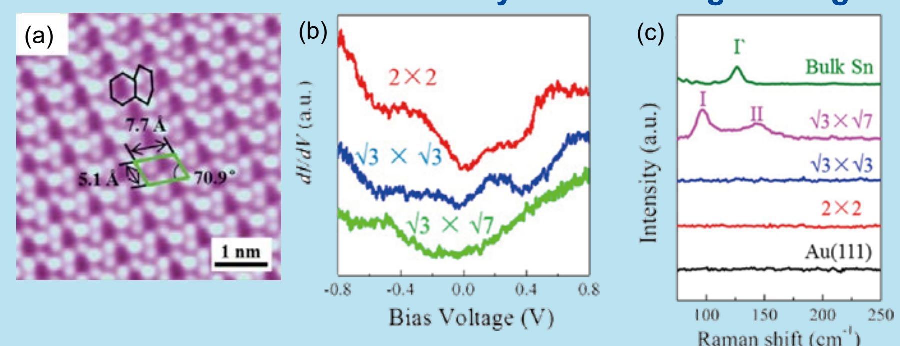
Experimental Realization of Two-Dimensional Buckled Lieb Lattice



(a) Atomic resolution STM image of 0.5 ML Sn on Al(100).
(b) Model structure of buckled Lieb lattice comprising Sn in a √2 ×√2 superstructure and the topmost Al atoms of the Al(100) substrate.
(c) 3D band structure of the buckled Lieb lattice, possessing a broken nodal line loop.

H. Feng, *et al*., Nano Lett. **20**, 2537 (2020).

Realization of Strained Stanene by Interface Engineering



(a) STM image of 1 ML Sn-deposited surface on the Au(111) substrate, showing a √3×√7 superstructure.
(b,c) *dI/dV* spectra and in-situ Raman spectra for the 2 ×2, √3 ×√3, and √3 ×√7 phases, respectively.

Y.Liu *et al*., J. Phys. Chem. Lett. **10**, 7, 1558 (2019).

Beer and Wine in Osaka

地ビール&ワイナリーマップ

Beer in Osaka 大阪のビール

※Newsletter編集部調べ

The place where the first Japanese beer was brewed in Dojima

国産ビール発祥の地碑

<History>

Shozaburo Shibutani founded Shibutani Beer, the 1st beer brewery by Japanese, in 1872. Komakichi Torii founded Osaka beer (currently ASAHI BREWERIES, LTD.) in 1889. SUNTORY started beer business in 1963.

渋谷庄三郎が日本最初のビール醸造所設立「渋谷ビール」販売(1872年)
鳥井駒吉大阪麦酒(現アサヒ)創業　サントリーは1963年にビール事業を開始しました。

<Statistics>

Production of beer in Osaka is 2nd largest in Japan.
Beer consumption per person in Osaka is 2nd largest in Japan.

大阪のビールの生産量は国内2位、ビール一人当たり消費量2位

Local Beer Report 現地に行って来ました!

Minoh Beer ・箕面ビール

Production is 5th largest in Japan. 出荷量は全国5位

Kuninocho Beer ・國乃長ビール

The oldest craft beer in Osaka　大阪最初のクラフトビール

Tasting Report 試飲レポ

ユニソク社員有志数名にて勤務後に試飲会を開催。
大阪のビールとワインを飲み比べてみました。

Minoh Beer・箕面ビール

Weizen・ヴァイツェン

飲みやすさ Drinkability ★★★★★
さわやかさ Light ★★★★★
フルーツ感 Fruity flavor ★★★
苦味 Bitterness ★
ABV.5.0%, IBU:12

Pale Ale・ペールエール

飲みやすさ Drinkability ★★★
麦芽感 Maltiness ★★★
ホップ感 Hoppy flavor ★★★
苦味 Bitterness ★★
ABV.5.5%, IBU:34

Stout・スタウト

飲みやすさ Drinkability ★★
コク Body ★★★
焙煎香 Roasted flavor ★★★★
苦味 Bitterness ★★
ABV.5.5%, IBU:32

Osaru IPA・おさるIPA

*Osaru means monkeys in Japanese.

飲みやすさ Drinkability ★★★
さわやかさ Light ★★★
ホップ感 Hoppy flavor ★★★★
苦味 Bitterness ★★★
ABV.6.0%, IBU:65

Imperial Stout・インペリアルスタウト

コク Body ★★★★
焙煎香 Roasted flavor ★★★★
甘味 Sweetness ★★
苦味 Bitterness ★★★
ABV.8.5%, IBU:60

Kuninocho Beer・國乃長ビール

Kura Kölsch・蔵ケルシュ

飲みやすさ Drinkability ★★★★★
さわやかさ Light ★★★★★
麦芽感 Maltiness ★★
苦味 Bitterness ★★
ABV.5.0%, IBU:25

Kura Amber・蔵アンバー

飲みやすさ Drinkability ★★★★
コク Body ★★
焙煎香 Roasted flavor ★★★
麦芽感 Moltiness ★★★
ABV.5.0%, IBU:20

Kijo Gold・貴醸ゴールド

飲みやすさ Drinkability ★★★
さわやかさ Light ★★
日本酒風味 Sake flavor ★★★
甘味 Sweetness ★★★★
ABV.5.0%, IBU:20

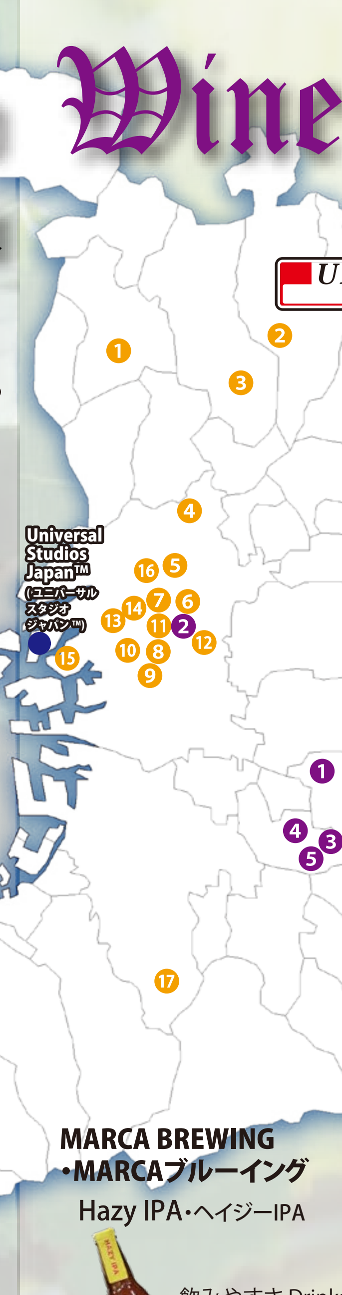
<番外>ユニソクの地元枚方発ビール

Hirakata Beer・枚方ビール

飲みやすさ Drinkability ★★★★
ホップ感 Hoppy flavor ★★★
フルーティ Fruity flavor ★★★
苦味 Bitterness ★★
ABV.4.7%, IBU:40

Hirakata Ale・HIRAKATAエール Ⓐ

飲みやすさ Drinkability ★★
飲みごたえ Body ★★
ホップ感 Hoppy flavor ★★★
苦味 Bitterness ★★★
ABV.5.0%, IBU:40



MARCA BREWING・MARCAブルーイング

Hazy IPA・ヘイジーIPA

飲みやすさ Drinkability ★★★
コク Body ★★★
ホップ感 Hoppy flavor ★★★★
苦味 Bitterness ★★★
ABV.7.0%, IBU:35

Grape Sour・グレープサワー

飲みやすさ Drinkability ★★★★
酸味 Sour ★★★★
フルーティ Fruity flavor ★★★★
苦味 Bitterness Zero
ABV.5.0%, IBU:10

Lemon Weizen・レモンヴァイツェン Ⓑ

飲みやすさ Drinkability ★★★★★
フルーティ Fruity flavor ★★★★★
辛口 Dry taste ★★
苦味 Bitterness Zero
ABV.5.0%, IBU:10

Coffee Amber・コーヒーアンバー Ⓔ

飲みやすさ Drinkability ★★★
コク Body ★★★
コーヒー感 Coffee flavor ★★★★★
甘味 Sweet ★
ABV.4.5%, IBU:10

Wine in Osaka 大阪のワイン

Introduction of Katashimo grapes village

堅下村葡萄の歴史パネル

<History>

The grapes recently produced in Osaka originate from the transplant of Koshu grapes from Osaka nursery garden to Kashiwara city in 1878. Since then, the grape production was expanded to wide areas in the southern part of Osaka during the Meiji and Taisho Eras and thus has a long history of more than 100 years.

近代の大阪府内で栽培されている葡萄は、明治11年(1878年)頃、当時の大阪府育苗園から柏原市に甲州葡萄の苗が移植されたのをきっかけに明治、大正期に中河内、南河内地域に広がり、現在にわたって栽培されており、100年以上の古い歴史がある。

<Statistics>

Wine production in Osaka used to be No. 1 in Japan.
Wine consumption per person is 5th largest in Japan. (As of 2018)

大阪のワインは1928~1938年の16年間、日本一の生産量
ワインの一人当たりの消費量5位(2018年現在)

Katashimo Winery Ⓒ カタシモワイナリー

Gomeiyama Merlot
・合名山メルロ(赤 辛口)

バランス Balance★★★★
フルーティ Fruity flavor★★★
ボディ(味の濃さ) Body★★★
(Medium body)
樽香 Barrel incense★★★
ABV.13.0%

Kawachi Winery Ⓓ 河内ワイン

Kintoku Wine Niagara
・金徳葡萄酒 ナイアガラ(白 辛口)

マスカット香 Muscatel flavor★★★★
辛口 Dry taste★★★★
酸味 Sour★★
さわやかさ、新鮮味 Freshness★★★★
ABV.12.0%

Local Winery Report 現地に行って来ました!

Katashimo Winery・カタシモワイナリー

The oldest winery in West Japan, founded by Sakujiro Takai in 1914
The wine was served at G20 Osaka Summit 2019.
高井作次郎創業 (西日本最古)　2019年G20大阪サミットで提供

Kawachi Winery・河内ワイン館

Farm/factory tours and tastings are held regularly.
定期的に農園・工場見学・試飲会が行われている

Osaka Local Craft Beer・大阪府内クラフトビール

1	Minoh Beer　箕面ビール	Minoh city, Osaka 大阪府箕面市
2	Osaka Kuninocho Beer　大阪國乃長ビール	Takatsuki city, Osaka 大阪府高槻市
3	3TREE BREWERY	Ibaraki city, Osaka 大阪府茨木市
4	Kamigata Beer　上方麦酒	Higashiyodogawa ward, Osaka city 大阪府大阪市東淀川区
5	Brewpub CenterPoint	Kita ward, Osaka city 大阪府大阪市北区
6	Brewpub Têtard Vallée	Chuo ward, Osaka city 大阪府大阪市中央区
7	BAK BEER	Chuo ward, Osaka city 大阪府大阪市中央区
8	Dotombori Beer　道頓堀地ビール	Chuo ward, Osaka city 大阪府大阪市中央区
9	Derailleur Brew Works	Nishinari ward, Osaka city 大阪府大阪市西成区
10	MARCA BREWING	Nishi ward, Osaka city 大阪府大阪市西区
11	ONE's BREWERY	Nishi ward, Osaka city 大阪府大阪市西区
12	Arimoto Beer　有本麦酒	Ikuno ward, Osaka city 大阪府大阪市生野区
13	Ichioka brewery　市岡ビール工房 地底旅行	Minato ward, Osaka city 大阪府大阪市港区
14	BEER BELLY	Nishi ward, Osaka city 大阪府大阪市西区
15	Tempozan Beer　天保山ビール	Minato ward, Osaka city 大阪府大阪市港区
16	Nakatsu brewery	Kita ward, Osaka city 大阪府大阪市北区
17	Sakai Shukaku Beer　堺収穫麦酒	Sakai city, Osaka 大阪府堺市
18	KIX BEER　KIX BEER 泉佐野ブルーイング	Izumisano city, Osaka 大阪府泉佐野市

Osaka Local Winery・大阪府内ワイナリー

1	Katashimo Winery　カタシモワイナリー	Kashiwara city, Osaka 大阪府柏原市
2	Fujimaru　島之内フジマル醸造所	Chuo ward, Osaka city 大阪府大阪市中央区
3	Asuka Wine　飛鳥ワイン	Habikino-city, Osaka 大阪府羽曳野市
4	Kawachi Wine　(株)河内ワイン	Habikino-city, Osaka 大阪府羽曳野市
5	Nakamura Wine　仲村わいん工房	Habikino-city, Osaka 大阪府羽曳野市
6	Hirakata sugi Ricoro farm　枚方杉リコロファーム	Hirakata-city, Osaka 大阪府枚方市

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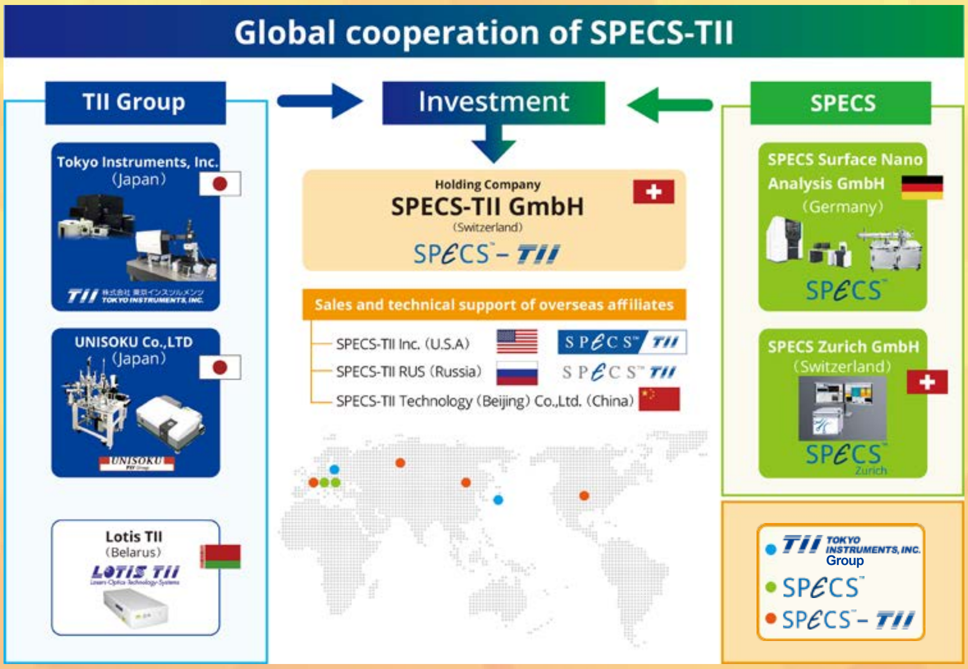

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