2022 UNISOKU NEWSLETTER

Current Delivery Situation　現在の納品状況

COVID-19 の感染拡大に伴う納品・訪問の遅れに対するお詫び

COVID-19 の世界的感染拡大による供給網の乱れは、2020 年前半から今日に至るまで弊社のサプライチェーンにも影響を与えており、特に電子部品関連や特殊な真空部品および超伝導マグネット等の納入に大幅な遅れをもたらしています。
納品をお待たせしているお客様には多大なご迷惑をおかけしておりますことをお詫び申し上げます。
今後もサプライヤーとの連絡を密にとり、弊社への受入れ段階での準備を整え、出荷を効率的に行ってまいります。

低温装置の社内テスト期間の短縮につきましては、液体ヘリウムの供給不足による出荷試験の遅延対策として、工場内に回収・再液化設備を設けました。十分な性能試験を短期間で行えるよう、精一杯努力してまいります。

納品のための訪問につきまして、中国での納品は SPECS-TII(Beijing) および弊社中国人技術者により、2020 年中盤から再開し、2021 年を通して実施いたしました。しかしながら、まだまだサポートが行き届いていない状況であり、お待たせしているお客様におかれましては誠に申し訳ございません。

欧米やその他地域での納品につきましては、まだ一部ではございますが、ワクチンの接種証明により隔離を免除される地域や近隣の地域について、訪問による納品を進めさせていただきました。
訪問させていただいた弊社技術者の安全にご配慮くださり、ご協力くださった方々に深く感謝いたします。

今後につきましても感染状況とともに日本政府による指導と渡航先の入国規制を確認しながら、訪問による納品や修理を順次進めさせていただきます。
ご不便をおかけいたしますが何卒ご理解賜りますようよろしくお願いいたします。

Our Apologies for Delayed Delivery and Repair Visits Due to COVID-19 Disruptions

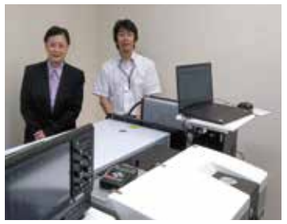
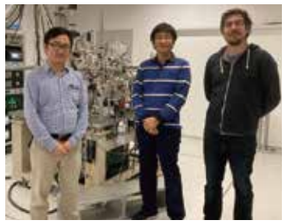
The global supply-chain disruption caused by the COVID-19 pandemic has affected our own supply chain since 2020. In particular, the deliveries of some electronic parts, vacuum components, and superconducting magnets have experienced severe delays. To our affected clients, we sincerely apologize for any inconvenience this might have caused, and we appreciate your patience and understanding.

We remain in constant contact with our suppliers to ensure timely production schedules and prompt product shipments. We have built a liquefier system for in-house liquid-helium recycling to counter the frequent low-temperature equipment-test delays associated with liquid-helium shortages. We continue to make every effort to conduct the performance tests without delay.

Regarding the installation of newly delivered instruments, we have resumed our on-site visits in China both by SPECS-TII Beijing and by local UNISOKU employees since the mid-2020. However, we apologize for any delay current restrictions on our logistic support might have caused.

Further, while on-site installation visits have resumed in the EU, USA, and other regions, we have only been able to reach areas that have been granting quarantine exemption for fully vaccinated persons. We thank the customers in these areas for their help in keeping our employees safe during their on-site visits.

From here onward, we will proceed with the postponed installation and repair on-site visits following the guideline set both by the Government of Japan and by the local immigration authorities. Once again, we apologize for any delay-related inconvenience and we appreciate your kind understanding.

Corporate Philosophy　経営理念

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。

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


President and CEO Yutaka Miyatake
代表取締役　宮武　優

Management Policy　経営方針

ユニークな計測器の提供にチャレンジ

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。以来、その精神を大切にし、お客様の声を聴きながら、新しい計測への挑戦と製品の改良を重ね、成長してまいりました。お客様の求める “観たい、測りたい” を実現できるよう、お客様にあった装置をご提案し、成果が出るまで訪問を重ね、お付き合いをさせていただくことを大切にしています。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。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。

The Challenge of Our Unique Instruments

Since its foundation in 1974, UNISOKU Co., Ltd. has taken on the challenge of "providing unique measuring instruments to the world", in the spirit of its first president Toshihiko Nagamura. To date, with this spirit in mind, we continue to listen to the voices of our customers, to take on new measurement techniques, and to improve our existing products. To satisfy their “desire to observe, know and solve” , we offer our customers cutting-edge instruments and provide on-site visits until their systems work properly producing useful measurements and positive results. Through these processes, we strive to build trustful relationships with our customers. We aim to grow as a company that is adaptable to change and that contributes to society by providing significant impacts and new values through measurement techniques. We will keep challenging ourselves, never giving up until our products meet the customers’ needs, and further improving our products and services.

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）	**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）	**47**（47 名）As of March 2022（2022 年 3 月現在）

Events in 2021

MAR 3月

Tatsuo Nakagawa gave an invited talk at the 101st Annual Meeting of The Chemical Society of Japan.
日本化学会 第101春季年会にて 中川がシンポジウムにて招待講演

APR 4月

UNISOKU achieved the 33rd Excellent Technology and New Product Award for medium sized companies.
第33回 中小企業優秀新技術・新製品賞 受賞

The project “Development of highly-hydrogen sensitive thermal desorption spectroscopy system” supported by Ichimura Foundation for New Technology was completed.
市村清新技術財団「薄膜材料用超高感度水素検出装置の開発」完了認定

Kelvin probe + evaporator system was shipped for the first time.
ケルビンプローブ＋蒸着装置を初出荷

The demo room for optical instruments was used by the first customer.
開設したデモルームに初めてのお客様を迎える

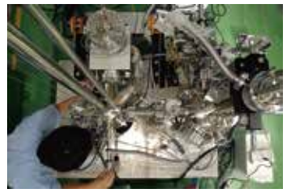


Photo introduced in the textbook “Junior High school Science 2”
令和3年度用「中学校 科学２」掲載写真

JUN 6月

Low temperature SNoiM was shipped for the first time.
低温SNoiMシステムを初出荷

AUG 8月

The article “Construction of time-resolved transient absorption spectroscopy system by RIPT method” (in Japanese) by Tatsuo Nakagawa was published in Photochemistry Vol. 52, No.2, 2021.
光化学協会誌「光化学」(Vol. 52, No.2, 2021)のトピックに「RIPT 法による過渡吸収分光システムの構築」(著者: 中川) が掲載される

UNISOKU joined the exhibition in the 32nd Meeting on Photochemistry of Coordination Compounds by The Japanese Photochemistry Association (Online).
第32回 配位化合物の光化学討論会 展示会（オンライン開催）

SEP 9月

UNISOKU SPM system was introduced in the textbook for junior high school students, “Junior High school Science 2” issued by GAKKOTOSHO Co., Ltd.
学校図書株式会社発行　令和3年度用「中学校　科学２」に掲載

The optical instruments department performed real-time company introduction at the Exhibition in Annual Meeting on Photochemistry 2021 (Online).
2021年光化学討論会 展示会（オンライン開催）、分光課でリアルタイム企業紹介を実施

UNISOKU joined the 15th Annual Meeting of Japan Society for Molecular Science 2021 (online).
第15回分子科学討論会 展示会（オンライン開催）

OCT 10月

TDS demo experiment service started.
TDSデモ実験受付開始

NOV 11月

The 1st RydeenAmp mounted on USM1300 was shipped (University Utrecht).
雷電アンプ搭載USM1300を初出荷(ユトレヒト大学)

Tea with powdered honey
粉末はちみつ入り紅茶

Takehiro Ozawa gave a talk at Annual Meeting of The Japan Society of Vacuum and Surface Science 2021.
小澤が2021年日本表面真空学会学術講演会で講演

Te’ Miel SUPREMO got a huge hit in UNISOKU.
ユニソク社内で粉末はちみつ入り紅茶が爆発的なヒット

32 persimmons were harvested in the field of UNISOKU.
ユニソク敷地内で柿が実り、32個の収穫となった

Installation of picoTAS/CoolSpeK at University of Hong Kong was completed.
海外初の picoTAS/CoolSpeK を香港大に納品を完了

A harvest of 32 persimmons
32個収穫した柿

DEC 12月

Katsuya Iwaya gave a poster presentation about time-resolved STM system developed in collaboration with Shigekawa group (University of Tsukuba) at ICSPM29 (online).
岩谷が国際会議ICSPM29において筑波大重川研と共同開発した時間分解STM装置についてポスター発表

Katsuya Iwaya gave an invited talk about TDS system developed in collaboration with Hosono group (Tokyo Institute of Technology) at MRM2021 (online).
岩谷が国際会議MRM2021において東工大細野研と共同開発した超高感度TDS装置について招待講演

Kazuo Kurita retired after working at UNISOKU for 44 years.
栗田一男氏（嘱託）が44年のユニソク勤務を終えご退職

Thank You Very Much for Your Work, Mr. Kurita.　栗田さん お疲れ様でした!

On 28 December 2021, we held a farewell party at UNISOKU for Kazuo Kurita, who had served us for 44 years, and presented him with a memento and an album.
2021年12月28日　ユニソクにて44年務めて来られた栗田一男さんの送別会を行い、記念品やアルバムを贈呈しました。

Meister of Machining and Mechanical Design, Kazuo Kurita, Retired after 44 years Working at UNISOKU.

Scenes from the Company and Small Talk　社内風景と話題

Autumn 2021, maple
2021年秋、もみじ

Radio exercise
有志でラジオ体操

Lunch break, Fun time !!
昼休みの楽しいひと時

Planting at Mr. Nagamura's (former chairman) farm (a volunteer farm club!)
長村(元会長)農園のさくづけ(有志にて農園部!)

Product Development News in 2021

2021年 製品開発 ニュース

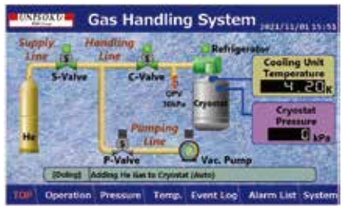
Cryogen-Free SPM (USM1800)

無冷媒STM

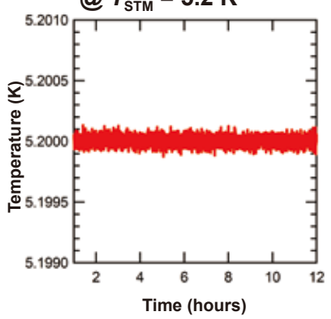
- **Base temperature T_{STM}= 5 K**
- **Low vibration noise level realized by our original design**

The design and performance of the prototype system will be published somewhere (J. Kasai *et al*., submitted).

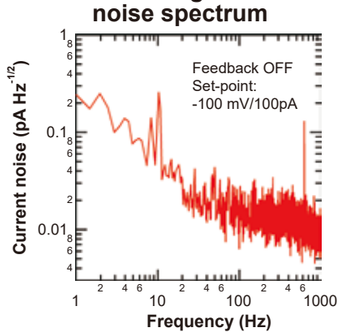
Automatic gas handling system



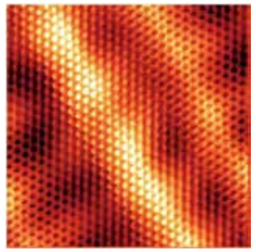
Temperature stability @ T_{STM} = 5.2 K



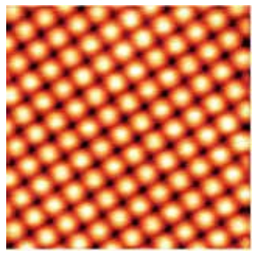
Tunneling current noise spectrum



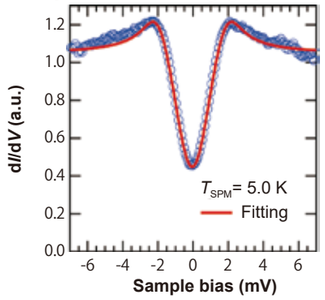
STM image of Au(111)



AFM image of NaCl(100)



Superconducting gap of Pb

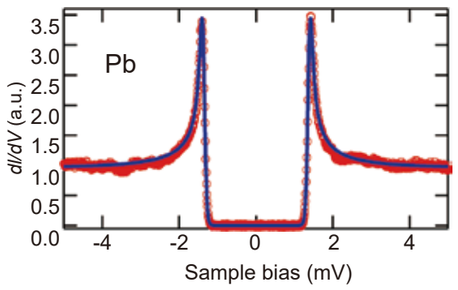


USM1300, 1600

強磁場中STM

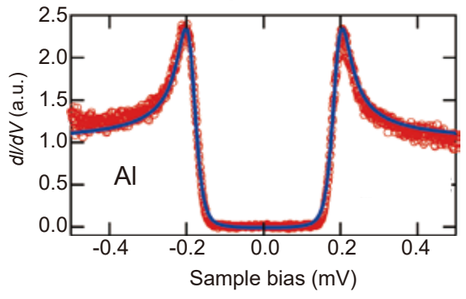
USM1300

Electron temperature ~ 360 mK



USM1600

Electron temperature ~ 110 mK



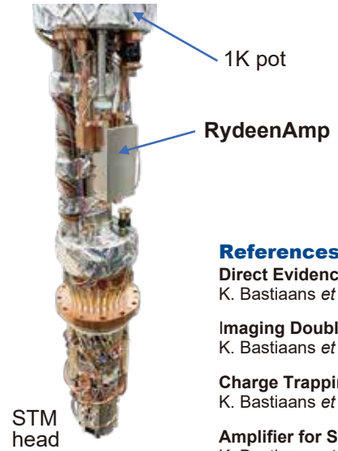
RydeenAmp

雷電アンプ

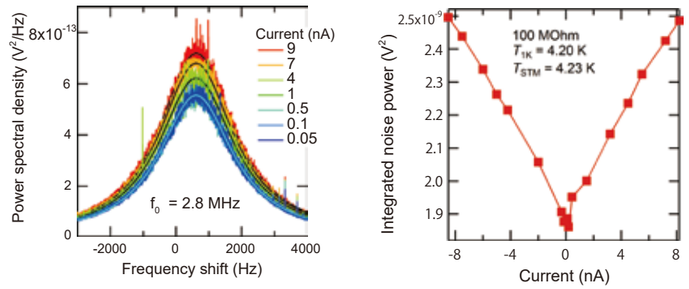
Collaboration with Prof. Milan Allan group (Leiden Univ.)

- **Atomic-scale shot noise measurements**
- **High resolution d*I*/d*V* spectra**
- **Operable in magnetic fields up to 7 Tesla**
- **Integration into USM1300 now available**

USM1300 cryostat



Shot noise measurement on Au(111)



References

Direct Evidence for Cooper Pairing without a Spectral Gap in a Disordered Superconductor above T_c
K. Bastiaans *et al*., Science **374**, 608 (2021).

Imaging Doubled Shot Noise in a Josephson Scanning Tunneling Microscope
K. Bastiaans *et al*., Phys. Rev. B **100**, 104506 (2019).

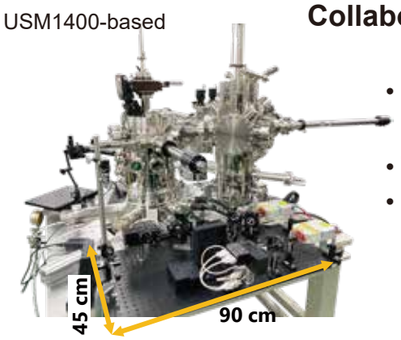
Charge Trapping and Super-Poissonian Noise Centres in a Cuprate Superconductor
K. Bastiaans *et al*., Nat. Phys. **14**, 1183 (2018).

Amplifier for Scanning Tunneling Microscopy at MHz Frequencies
K. Bastiaans *et al*., Rev. Sci. Instrum. **89**, 093709 (2018).

Time-Resolved STM

時間分解STM

USM1400-based

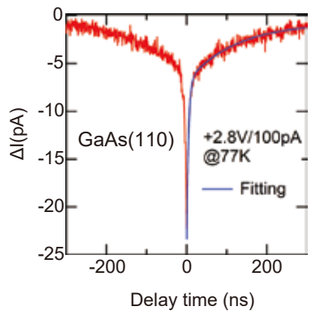


Collaboration with Prof. Shigekawa Group (Univ. of Tsukuba)

This work is supported by A-STEP, JST.

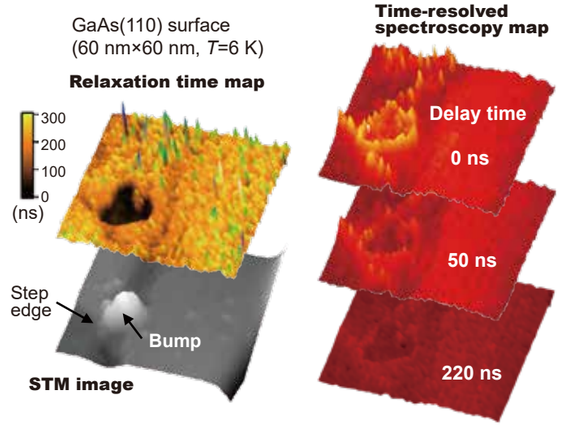
- **Compact table-top optical system (Integration into an existing SPM system is possible)**
- **Time resolution of 70 ps**
- **Carrier dynamics measurements with sub-nm spatial resolution**

Typical time-resolved tunneling spectrum



Time-resolved spectroscopy mapping

GaAs(110) surface
(60 nm×60 nm, *T*=6 K)



Introduction of Publications

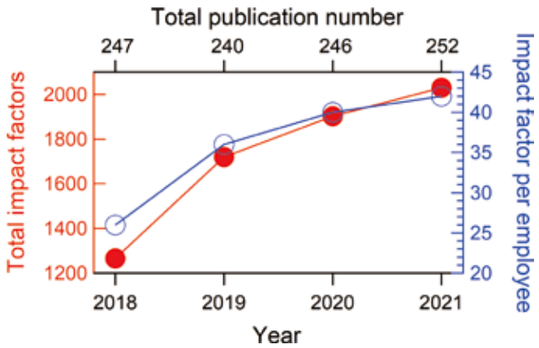
論文の紹介

Publication Stats in 2021

Total number of publications using UNISOKU systems* = 252 (246 in 2020)
Total impact factors ~ 2030 (1902 in 2020)
Corresponding to 41 Nature papers (38 in 2020)
Impact factor per employee ~42 (~40 in 2020)
c.f. the impact factor of Nature ~50

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

Popular Research Fields	Num. of Publications	Average Impact Factor
Topological Materials (Kagome, Majorana, Weyl)	37	14.14
Thin Films excluding TMDs (Nanowire, 2D Superconductivity, 2D vdW, etc)	36	9.35
Graphene (Twisted Bilayer Graphene)	22	10.82
Molecules	19	9.09
Transition Metal Dichalcogenides (TMDs)	12	16.66
Fe-based Superconductors (FeSe/STO)	11	9.67
RIPT Transient Absorption	8	9.73



Determining Structural and Chemical Heterogeneities of Surface Species at the Single-Bond Limit

Xu *et al*., Science, **371**, 6531 (2021).

Atoms / Molecules 原子 / 分子

The structure identification of adsorbed species on surface has long been a challenge due to their rich chemical heterogeneities. Xu *et al*. (Hou group, Univ. of Science and Technology of China) revealed structural and chemical heterogeneities of the pentacene molecule and its derivatives at the single-bond limit by utilizing a combination of STM, nc-AFM, and tip-enhanced Raman spectroscopy (TERS). They found that each molecule shows different microscope images and Raman spectrum maps, reflecting the existence/absence of C-H stretching bond in the molecules. Owing to the unambiguous structural information obtained from the combined measurements, the experimental results were better reproduced by DFT calculations. The combination of STM, AFM and TERS provides a comprehensive solution for determining chemical structures and can be widely applied for studying surface catalysis, on-surface synthesis, and 2D materials.

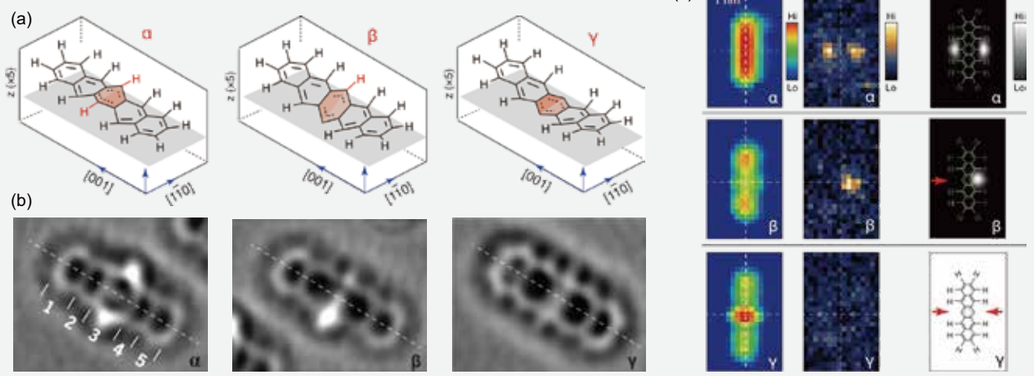


Figure (a) Schematic images of pentacene molecule (α) and its derivatives (β and γ). (b) Constant height frequency shift images of (a).
(c) STM image, TERS map, and Raman simulation of α, β, γ species.

Application Fields of UNISOKU SPM

UNISOKU SPMの応用分野

Atoms/Molecules 原子/分子

STM-AFM-TERS

Determining Structural and Chemical Heterogeneities of Surface Species at the Single-Bond Limit
J. Xu *et al*., Science **371**, 818 (2021).

Probing Intramolecular Vibronic Coupling through Vibronic-State Imaging
F. Kong *et al*., Nat. Commun. **12**, 1280 (2021).

Atomic Point Contact Raman Spectroscopy of a Si(111)-7 × 7 Surface
S. Liu *et al*., Nano Lett. **21**, 4057 (2021).

Anti-Stokes Light Scattering Mediated by Electron Transfer Across a Biased Plasmonic Nanojunction
S. Liu *et al*., ACS Photonics DOI: 10.1021/acsphotonics.1c00402

Atomic/Molecular Spin (ESR-STM)

Free Coherent Evolution of a Coupled Atomic Spin System Initialized by Electron Scattering
L. Veldman *et al*., Science **372**, 964 (2021).

Electron Spin Resonance of Single Iron Phthalocyanine Molecules and Role of Their Non-Localized Spins in Magnetic Interactions
X. Zhang *et al*., Nat. Chem. DOI: 10.1038/s41557-021-00827-7

Engineering Atomic-Scale Magnetic Fields by Dysprosium Single Atom Magnets
Singha *et al*., Nat. Commun. **12**, 4179 (2021).

Quantum Stochastic Resonance of Individual Fe Atoms
M. Hanze *et al*., Sci. Adv. **7**, eabg2616 (2021).

Coherent Spin Control of Single Molecules on a Surface
P. Willke *et al*., ACS Nano DOI: 10.1021/acsnano.1c06394

Molecules

On-Surface Preparation of Coordinated Lanthanide-Transition-Metal Clusters
J. Liu *et al*., Nat. Commun. **12**, 1619 (2021).

Electronic Characterization of a Charge-Transfer Complex Monolayer on Graphene
Kumar *et al*., ACS Nano **15**, 9945 (2021).

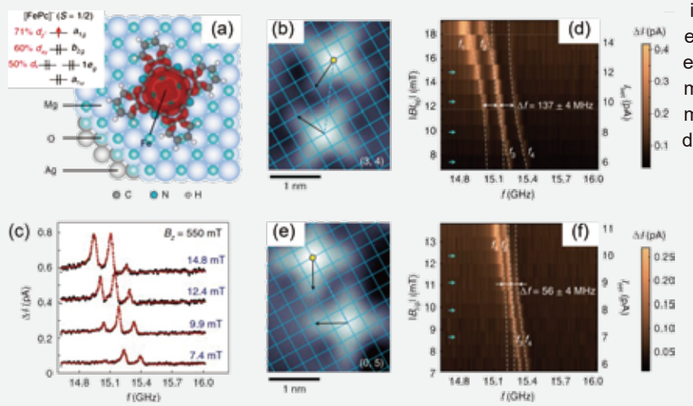
Packing Biomolecules into Sierpiński Triangles with Global Organizational Chirality
C. Li *et al*., J. Am. Chem. Soc. **143**, 14447 (2021).

Electron Spin Resonance of Single Ion Phthalocyanine Molecules and Role of Their Non-Localized Spins in Magnetic Interactions

Zhang *et al*., Nat. Chem. DOI: 10.1038/s41557-021-00827-7

Atoms / Molecules 原子 / 分子

Chemical engineering and fabrication of single molecular spins is a key for developing molecule-based quantum devices. For this purpose, understanding of the magnetic interaction between molecules at the single molecular scale is crucial. Zhang *et al*. (Choi group, Institute for Basic Science and Physics Department, Ewha Womans Univ., Korea) performed ESR-STM measurements on individual iron phthalocyanines (FePc) molecules and investigated the magnetic interaction between FePc-FePc dimers. Their experimental results combined with DFT calculations revealed the crucial role of non-localized spins in the magnetic interactions, indicating a strongly molecular-geometry-dependent exchange coupling. The capability of ESR-STM is now extended from single atoms to much larger magnetic molecules and will contribute to the development of molecule-based spintronic and quantum information devices in the near future.



(a)The calculated spin density of a $[FePc]^{-1}$ molecule (in red) adsorbed on MgO/Ag(100) surface.
(b) STM image of the $[FePc]^{-1}$-$[FePc]^{-1}$ dimer in configuration (3, 4).
(c) Representative ESR spectra of the upper $[FePc]^{-1}$ measured at the yellow dot in (b).
(d) ESR spectra of the upper $[FePc]^{-1}$ in (b) as a function of tunneling current.
(e) STM image of the $[FePc]^{-1}$-$[FePc]^{-1}$ dimer in configuration (0, 5).
(f) ESR spectra of the upper $[FePc]^{-1}$ in (e)

Application Fields of UNISOKU SPM　UNISOKU SPMの応用分野

Thin Films (2D van der Waals Family TMD)　薄膜

Graphene

Doping Graphene with Substitutional Mn
P. Lin *et al*., ACS Nano **15**, 5449 (2021).

Quantum Interferences of Pseudospin-Mediated Atomic-Scale Vortices in Monolayer Graphene
Y. Zhang *et al*., Nano Lett. **21**, 2526 (2021).

Direct Observation of Global Elastic Intervalley Scattering Induced by Impurities on Graphene
C. Wang *et al*., Nano Lett. **21**, 8258 (2021).

Atomic Structure and Electronic Properties of the Intercalated Pb Atoms Underneath a Graphene Layer
T. Hu *et al.,* Carbon DOI: 10.1016/j.carbon.2021.04.020

Graphene Nanoribbon Grids of Sub-10 nm Widths with High Electrical Connectivity
N. Kim *et al*., ACS Appl. Mater. Interfaces DOI: 10.1021/acsami.1c03437

Fabrication and Mechanism of Pb-Intercalated Graphene on SiC
D. Yang *et al*., Appl. Surf. Sci. **569**, 151012 (2021).

Twisted Bilayer Graphene

Correlation-Driven Topological Phases in Magic-Angle Twisted Bilayer Graphene
Y. Choi *et al*., Nature **589**, 536 (2021).

Interaction-Driven Band Flattening and Correlated Phases in Twisted Bilayer Graphene
Y. Choi *et al*., Nat. Phys. **17**, 1375 (2021).

Oscillations of the Spacing Between Van Hove Singularities Induced by Sub-Ångstrom Fluctuations of Interlayer Spacing in Graphene Superlattices
Y. Zhao *et al*., Phys. Rev. Lett. **127**, 266801 (2021).

Monolayer & Heterostructure Films

Artificial Heavy Fermions in a van der Waals Heterostructure
V. Vano *et al*., Nature **599**, 582 (2021).

Moiré Enhanced Charge Density Wave State in Twisted 1T-$TiTe_2$/1T-$TiSe_2$ Heterostructures
W. Zhao *et al*., Nat. Mater. DOI: 10.1038/s41563-021-01167-0

Atomic Visualization and Switching of Ferroelectric Order in β-In_2Se_3 Films at the Single Layer Limit
Z. Zhang *et al*., Adv. Mater. **34**, 2106951 (2022).

Lattice-Matched Metal-Semiconductor Heterointerface in Monolayer Cu_2Te
J. Feng *et al*., ACS Nano **15**, 3415 (2021).

Realization of AlSb in the Double-Layer Honeycomb Structure: a Robust Class of Two-Dimensional Material
L. Qin *et al*., ACS Nano **15**, 8184 (2021).

Electronic and Magnetic Characterization of Epitaxial $CrBr_3$ Monolayers on a Superconducting Substrate
S. Kezilebieke *et al*., Adv. Mater. **33**, 2006850 (2021).

Strain-Induced Bandgap Enhancement of InSe Ultrathin Films with Self-Formed Two-Dimensional Electron Gas
Z. Zhang *et al*., ACS Nano **15**, 10700 (2021).

Synthesis and Properties of Monolayer MnSe with Unusual Atomic Structure and Antiferromagnetic Ordering
M. Aapro *et al*., ACS Nano **15**, 13794 (2021).

Charge Transfer Gap Tuning via Structural Distortion in Monolayer 1T-$NbSe_2$
Z. Liu *et al*., Nano Lett. **21**, 7005 (2021).

Direct Growth of van der Waals Tin Diiodide Monolayers
Q. Yuan *et al*., Adv. Sci. **8**, 2100009 (2021).

Atomic Imaging of Electrically Switchable Striped Domains in β′-In_2Se_3
Z. Chen *et al*., Adv. Sci. **8**, 2100713 (2021).

Magnetic Doping Induced Superconductivity-to-Incommensurate Density Waves Transition in a 2D Ultrathin Cr-Doped Mo_2C Crystal
S. Li *et al*., ACS Nano **15**, 14938 (2021).

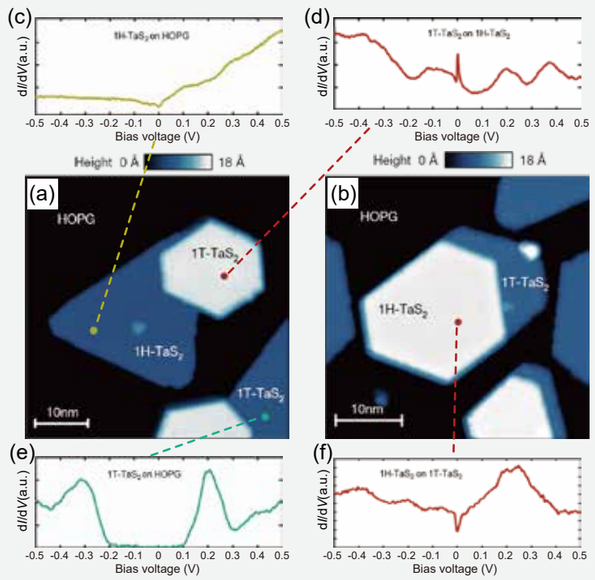
Robust Charge-Density Wave Strengthened by Electron Correlations in Monolayer 1T-$TaSe_2$ and 1T-$NbSe_2$
Y. Nakata *et al*., Nat. Commun. **12**, 5873 (2021).

Uncovering the Self-Organized Nanowires on Au-Modified Ge(001) Surfaces
J. Lyu *et al*., J. Phys. Chem. C **125**, 27876 (2021).

Artificial Heavy Fermions in a van der Waals Heterostructure

Vano *et al*., Nature, **599**, 582 (2021).

Thin Films　薄膜



Heavy fermion systems are known to exhibit exotic behaviors such as quantum criticality and unconventional topological superconductivity but have been realized only in compounds containing rare-earth elements with f electrons. Vano *et al*., (Liljeroth group, Aalto University, Finland) realized artificial heavy fermion systems by growing 1T-TaS_2/1H-TaS_2 heterostructures on HOPG and investigated their electronic states, using low temperature STM and STS. Spectroscopy on the 1T-TaS_2 layer of the heterostructure shows a Kondo resonance peak due to the interaction between localized magnetic moments in the 1T-TaS_2 and the 1H-TaS_2 conduction electrons. On the other hand, probing the 1H-TaS_2 layer of the heterostructure shows the signature of a heavy fermion hybridization gap. The realization of artificial heavy fermions in a van der Waals heterostructure will open a pathway towards understanding heavy-fermion physics and ultimately enabling the study of heavy-fermion superconductivity tunable by gating and twist engineering.

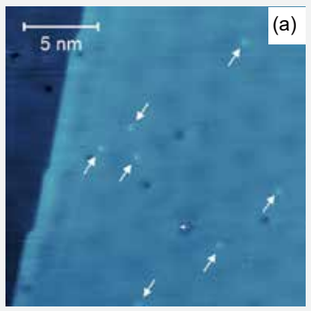
Figure
(a, b) STM image of 1T/1H-TaS_2 and 1H/1T-TaS_2 heterostructure on HOPG substrate, respectively.
(c-f) d*I*/d*V* spectrum on 1H-TaS_2 on HOPG, 1T/1H-TaS_2 heterostructure, 1T-TaS_2 on HOPG, 1H/1T-TaS_2 heterostructure, respectively.

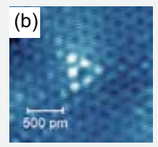
Doping Graphene with Substitutional Mn

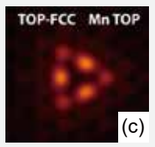
Lin *et al*., ACS Nano, **15**, 5449 (2021).

Thin Films　薄膜

Magnetic functionalization of graphene has been extensively investigated for fundamental physics and applications in spintronics. However, the substitutional doping of magnetic elements such as transition metals into graphene lattice is not thermodynamically favored in general, and the doping methods previously reported were difficult to control. Lin *et al*., (Pereira group, KU Leuven, Belgium) succeeded in the substitutional Mn doping into the graphene lattice by using ultra-low energy ion implantation and thoroughly characterized the atomic and electronic structures of substitutional Mn atoms by a combination of various experimental techniques (STM, Raman spectroscopy, ARPES, XPS) and DFT calculations. They revealed that the Dirac-like band structure was retained at a concentration of the order of 0.04%, providing an ideal platform to study the interplay between local magnetic moments and Dirac electrons. Their doping method is expected to be applied for various dopant elements and 2D material hosts and allows us to explore magnetic functionalization of 2D materials.







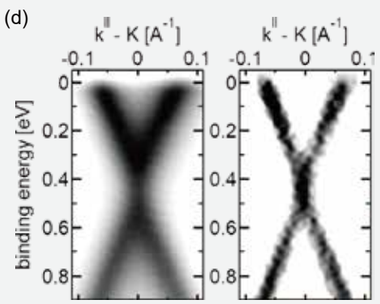


Figure
(a) STM image of the Mn implanted graphene surface.
(b) STM image of the substitutional Mn defect.
(c) DFT simulated STM image of Mn defect.
(d) ARPES spectra of Mn implanted graphene.

Application Fields of UNISOKU SPM　UNISOKU SPMの応用分野

Superconductivity　超伝導

Kagome Superconductors

Cascade of Correlated Electron States in a Kagome Superconductor CsV_3Sb_5
H. Zhao *et al*., Nature **599**, 216 (2021).

Roton Pair Density Wave in a Strong-Coupling Kagome Superconductor
H. Chen *et al*., Nature **599**, 222 (2021).

Unconventional Chiral Charge Order in Kagome Superconductor KV_3Sb_5
Y. Jiang *et al*., Nat. Mater. **20**,1353 (2021).

Charge Density Wave Orders and Enhanced Superconductivity under Pressure in the Kagome Metal CsV_3Sb_5
Q. Wang *et al*., Adv. Mater. **33**, 2102813 (2021).

Three-Dimensional Charge Density Wave and Surface-Dependent Vortex-Core States in a Kagome Superconductor CsV_3Sb_5
Z. Liang *et al*., Phys. Rev. X **11**, 031026 (2021).

Multiband Superconductivity with Sign-Preserving Order Parameter in Kagome Superconductor CsV_3Sb_5
H. Xu *et al*., Phys. Rev. Lett. **127**, 187004 (2021).

Topological Superconductors (Majorana)

Anomalous Superconducting Proximity Effect in $Bi_2Se_3/FeSe_{0.5}Te_{0.5}$ Thin-Film Heterojunctions
Y. Zhang *et al*., Adv. Mater. DOI: 10.1002/adma.202107799

Evidence of Topological Boundary Modes with Topological Nodal-Point Superconductivity
A. Nayak *et al*., Nat. Phys. **17**, 1413 (2021).

Anisotropic Non-Split Zero-Energy Vortex Bound States in a Conventional Superconductor
H. Kim *et al*., Appl. Phys. Rev. **8**, 031417 (2021).

Observation of Magnetic Adatom-Induced Majorana Vortex and its Hybridization with Field-Induced Majorana Vortex in an Iron-Based Superconductor
P. Fan *et al*., Nat. Commun. **12**, 1348 (2021).

Majorana Zero Modes in Impurity-Assisted Vortex of LiFeAs Superconductor
L. Kong *et al*., Nat. Commun. **12**, 4146 (2021).

Tomonaga–Luttinger Liquid in the Topological Edge Channel of Multilayer FeSe
H. Zhang *et al*., Nano Lett. DOI: 10.1021/acs.nanolett.1c02069

Fe-based Superconductors

Nematic Transition and Nanoscale Suppression of Superconductivity in Fe(Te,Se)
H. Zhao *et al*., Nat. Phys. **17**, 903 (2021).

Nanoscale Decoupling of Electronic Nematicity and Structural Anisotropy in FeSe Thin Films
Z. Ren *et al*., Nat. Commun. **12**, 10 (2021).

Spatially Dispersing Yu-Shiba-Rusinov States in the Unconventional Superconductor $FeTe_{0.55}Se_{0.45}$
D. Chatzopoulos *et al*., Nat. Commun. **12**, 298 (2021).

Observation of an Electronic Order along [110] Direction in FeSe
K. Bu *et al*., Nat. Commun. **12**, 1385 (2021).

Incommensurate Smectic Phase in Close Proximity to the High-T_c Superconductor $FeSe/SrTiO_3$
Y. Yuan *et al*., Nat. Commun. **12**, 2196 (2021).

Two Distinct Superconducting States Controlled by Orientations of Local Wrinkles in LiFeAs
L. Cao *et al*., Nat. Commun. **12**, 6321 (2021).

Friedel Oscillations of Vortex Bound States under Extreme Quantum Limit in $KCa_2Fe_4As_4F_2$
X. Chen *et al*., Phys. Rev. Lett. **126**, 257002 (2021).

Observation of Distinct Spatial Distributions of the Zero and Nonzero Energy Vortex Modes in $(Li_{0.84}Fe_{0.16})OHFeSe$
T. Zhang *et al*., Phys. Rev. Lett. **126**, 127001 (2021).

Thin Film Superconductors

Direct Evidence for Cooper Pairing Without a Spectral Gap in a Disordered Superconductor Above T_c
K. Bastiaans *et al*., Science **374**, 608 (2021).

Direct Observation of Nodeless Superconductivity and Phonon Modes in Electron-Doped Copper Oxide $Sr_{1-x}Nd_xCuO_2$
J. Fan *et al*., Natl. Sci. Rev. DOI: 10.1093/nsr/nwab225

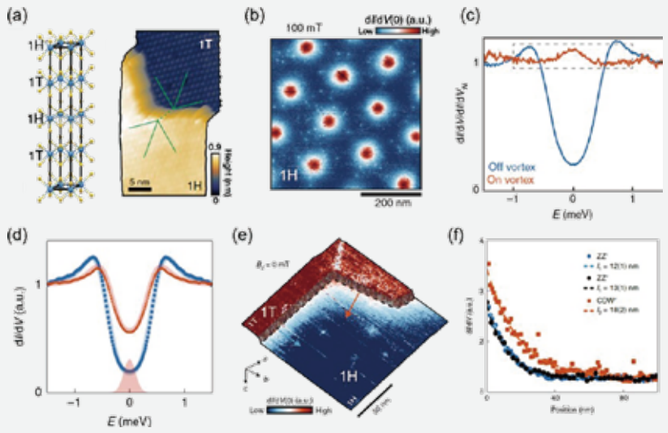
Proximity Effects on the Charge Density Wave Order and Superconductivity in Single-Layer $NbSe_2$
P. Dreher *et al*., ACS Nano **15**, 19430 (2021).

Evidence of Topological Boundary Modes with Topological Nodal-Point Superconductivity

Nayak *et al*., Nat. Phys. **17**, 1413 (2021).

Superconductivity　超伝導

Topological superconductors have been extensively explored to realize topological quantum information processing. However, material realizations of intrinsic topological superconductors are still scarce. Nayak *et al*. (Beidenkopf group, Weizmann Institute of Science, Israel) reported spectroscopic evidence for the existence of topological surface superconductivity in a transition metal dichalcogenide 4Hb-TaS_2, which consists of the alternating stacking of strongly correlated 1T-TaS_2 and superconducting 1H-TaS_2 layers. They observed crystallographically anisotropic 1D boundary edge modes and zero-bias states at the vortex core, together with a finite density of states in the superconducting gap. Their results combined with theoretical modelling suggest that a topological nodal-point superconducting state is realized in the natural compound 4Hb-TaS_2.



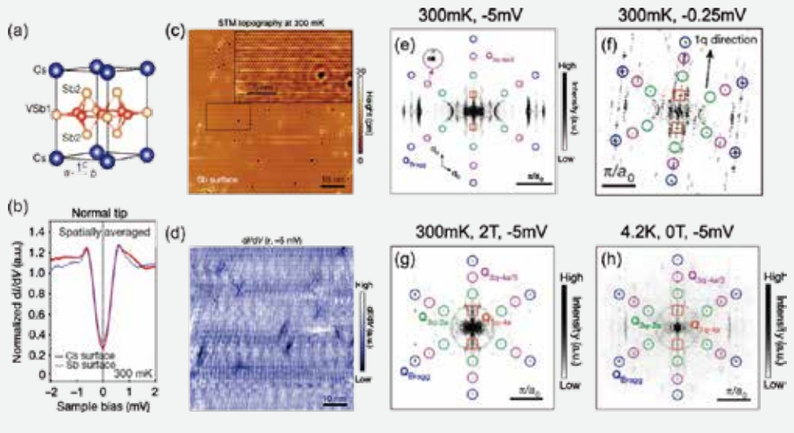
(a) Crystal structure of 4Hb-TaS_2 (left). STM image of 4Hb-TaS_2 showing both 1H and 1T terminations (right).
(b) Zero bias conductance map on the 1H termination. B = 100 mT. T = 0.38 K.
(c) d*I*/d*V* spectra at the vortex core and far from it in (b).
(d) d*I*/d*V* spectra measured far away (blue) and close to (red) the 1H step edge.
(e) Zero bias conductance map showing the continuous edge mode under the 1T step edge.
(f) Anisotropic zero bias conductance profile in (e).

Roton Pair Density Wave in a Strong-Coupling Kagome Superconductor

Chen *et al*., Nature **599**, 222 (2021).

Superconductivity　超伝導

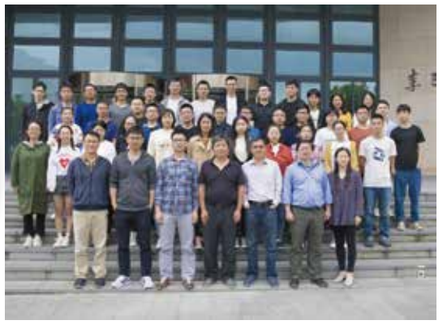
The kagome lattice of transition metal atoms offers us an ideal platform to investigate electronic correlation in the presence of geometric frustration and topological band structures. Chen *et al*. (Hong-Jun Gao group, Chinese Academy of Sciences) reported unconventional superconducting states of a new family of vanadium-based kagome metal, CsV_3Sb_5 using STM/STS. It was found that CsV_3Sb_5 exhibits strong-coupling superconductivity that coexists with $4a_0$ unidirectional, $2a_0\times2a_0$ charge orders, and a pair density wave (PDW) accompanied by bidirectional $4a_0/3$ spatial modulations of the superconducting gap, coherence peak, and gap-depth in the tunneling spectrum. They also revealed that the PDW is a “mother state” responsible for the pseudogap and intertwined electronic order. These results showing striking analogies and distinctions to high-T_c cuprates contribute to the understanding of the origin of correlated electronic states and superconductivity in vanadium-based kagome metals.



(a) Crystal structure of CsV_3Sb_5.
(b) Superconducting gap spectra on Cs and Sb surfaces at 300mK.
(c) STM image of Sb surface at 300mK.
(d) d*I*/d*V* map at -5mV simultaneously obtained with (c), resolving the $4a_0$, $2a_0\times2a_0$ charge orders and $4a_0/3$ PDW.
(e) Fourier transformed image of (d).
(f-h) Fourier transformed image of d*I*/d*V* map(-0.25mV) at 300mK, d*I*/d*V* map(-5mV) at 300mK and 2T, and d*I*/d*V* map(-5mV) at 4.2K and 0T, respectively.

Jinfeng Jia

Laboratory of Low Dimensional Physics and Interface Engineering, Shanghai Jiao Tong University, China



Research Interests

- Topological Superconductor and Majorana Fermions
- Topological Insulators and New Quantum Materials
- Surface and Interface Physics by Low Temperature STM/STS

SPM Facilities in the Team

USM1300 4PP (11 T)

JT-SPM

USM1600 (Vector)

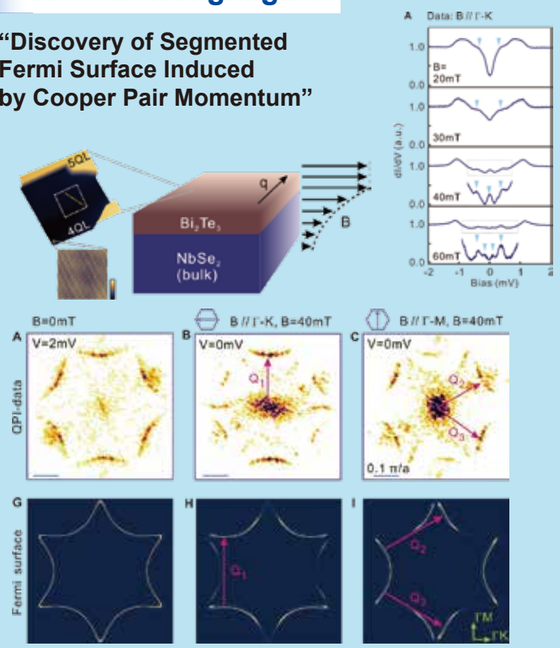
USM1600

USM1300 (11 T)

USM1300 4PP (11 T)

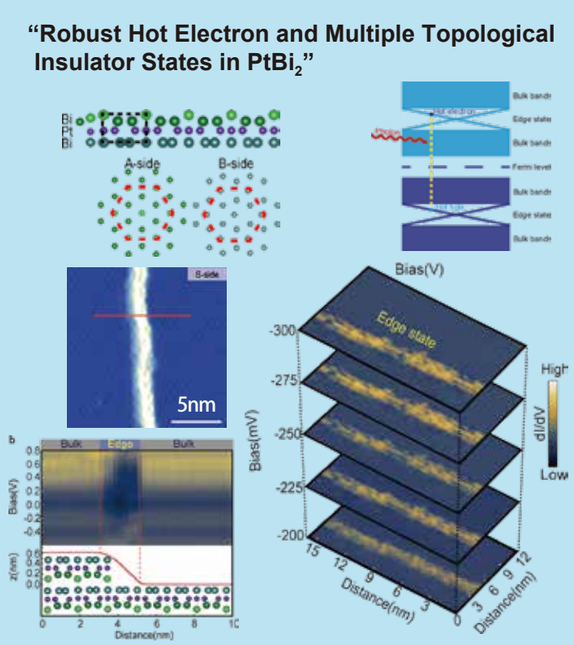
Research Highlights

"Discovery of Segmented Fermi Surface Induced by Cooper Pair Momentum"



Z. Zhu *et al*., Science **374**, 1381 (2021).

"Robust Hot Electron and Multiple Topological Insulator States in $PtBi_2$"



X. Nie *et al*., ACS Nano **14**, 2366 (2020).

Stevan Nadj-Perge

Department of Applied Physics and Materials Science, California Institute of Technology (CALTECH) , USA

Research Interests

- Scanning Tunneling Microscopy and Spectroscopy
- Quantum Transport
- Low Dimensional Materials, Multi-Terminal Devices
- Moiré Heterostructures
- Magic-Angle Twisted Multi-Layer Graphene
- Strongly Correlated Materials
- Topological Superconductors

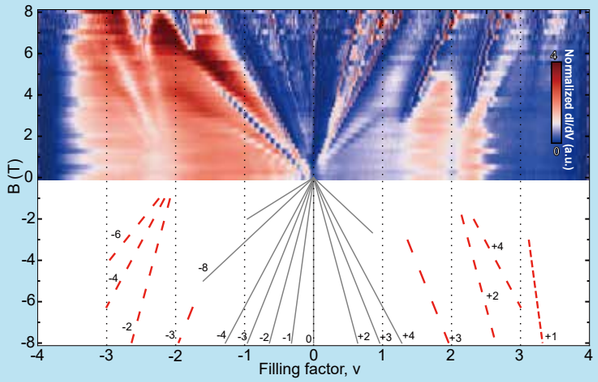
SPM Facilities in the Team

USM1300

Features:

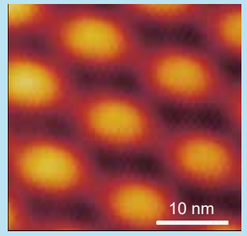
- 9-2-2 T Vector Magnet
- STM/AFM Capability
- Six Independent Contacts on the Sample Holder
- Support for High Frequency Signals

Local Density of States Landau Fan Diagram of Twisted Bilayer Graphene

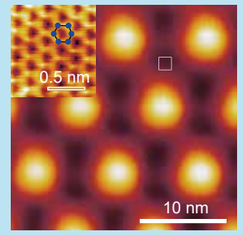


Topographic Imaging of Magic-angle Superlattices

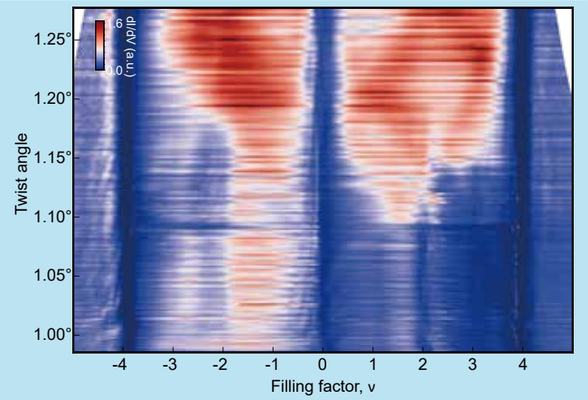
Twisted Bilayer Graphene



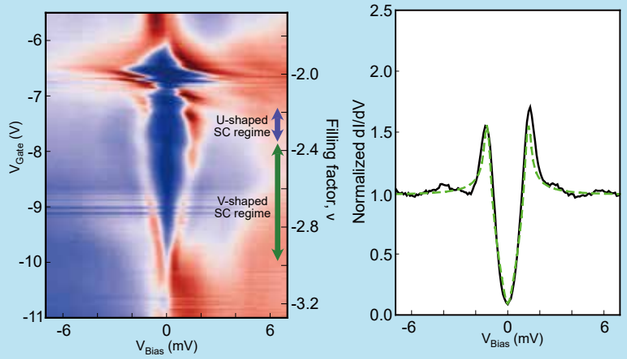
Twisted Trilayer Graphene



Mapping Out the Development of Correlated Insulators with Twist Angle



Unconventional Superconductivity in Twisted Trilayer Graphene



Selected References:

(1) Y. Choi *et al*., Nat. Physics **15**, 1174 (2019).
(2) Y. Choi, H. Kim *et al*., Nature **589**, 536 (2021).
(3) Y. Choi, H. Kim *et al*., Nat. Physics **17**, 1375 (2021).
(4) H. Kim, Y. Choi *et al*., arxiv: 2109.12127 (2021).

Yasuhiro Sugawara

Nanophysics Group,
Department of Applied Physics,
Graduate School of Engineering,
Osaka University, Japan

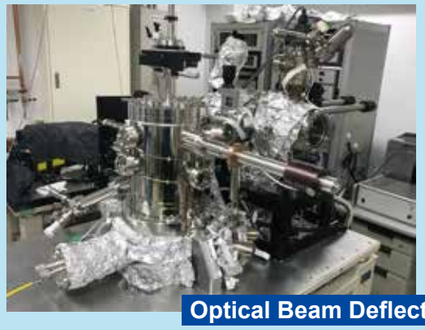
Research Interests

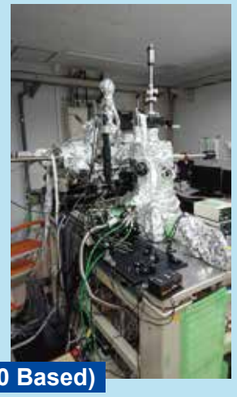
- Photo-Induced Force Microscopy (Nano-Photonics)
- Catalytic Reactions by AFM and KPFM
- Charge States of Atoms and Molecules by AFM

Prof. Sugawara

Prof. Y. J. Li

SPM Facilities in the Team



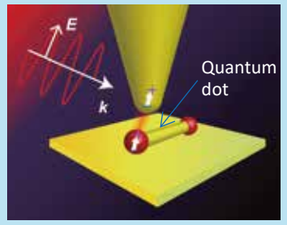


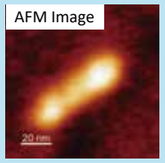
Optical Beam Deflection Type AFM System (USM1400 Based)

Research Highlights

"Optical Force Mapping at the Single-Nanometre Scale"

Photoinduced Force Microscopy (PiFM)

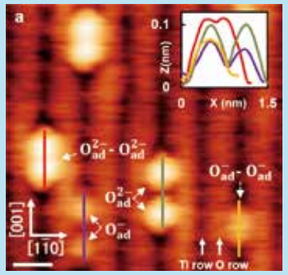




J.Yamanishi *et al*., Nat. Commun., **12**, 3865 (2021).

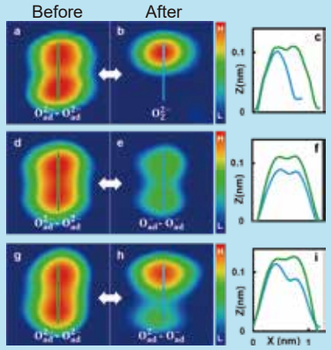
"Tip-Induced Control of Charge and Molecular Bonding of Oxygen Atoms"

AFM Image of Rutile TiO_2(110) Surface



Kelvin Probe Force Spectroscopy Manipulation

Before After

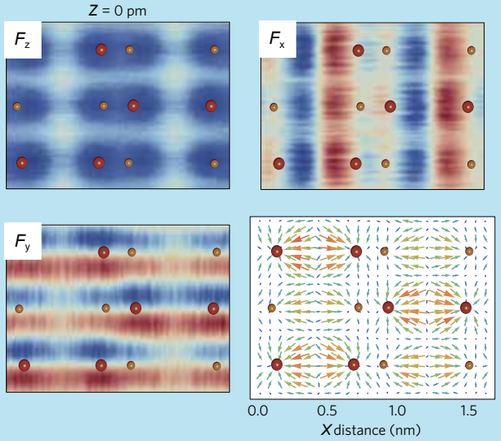


Y. Adachi *et al*.,
ACS Nano **13**, 6917 (2019).

"Subatomic-Scale Force Vector Mapping Using Bimodal AFM"

Ge(001)-c(4×2) Surface

Z = 0 pm



Y. Naitoh *et al*., Nat. Phys. **13**, 663 (2017).

来社実験サービスのご案内

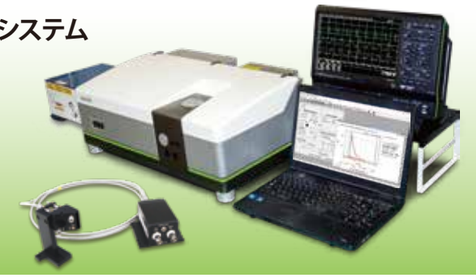
We Now Offer In-House Experimental Demonstrations.

弊社では最新製品のデモルームを開設し、来社実験サービスを行っています。興味を持っていただいた製品について、購入前に実際に性能を確認の上、購入後も満足して使っていただきたいと考えております。また、装置購入が困難なお客様にも測定をしていただき研究の一助となりたいとも願っております。

Because we aim for after-purchase satisfaction, we provide our customers the opportunity to check the product performance before purchase. Further, we also aim to help customers who are not ready to purchase our systems conduct their research. To these ends, we have set up a room showing the newest instruments, both for demonstration purposes and for in-house experiment service.

ピコ秒過渡吸収分光 + 蛍光寿命コンバインシステム
picoTAS + TCSPC

Combined System of Picosecond Transient Absorption and TCSPC Fluorescence Lifetime



分光用クライオスタット
CoolSpeK※

Cryostat for Spectrophotometer USP-203 Series

近赤外対応ナノ秒時間分解分光測定装置
TSP-2000

Conventional UV/VIS/NIR Flash Photolysis System

※CoolSpeKにつきましてはお客様のラボに伺い、お客様が所有している分光計と組み合わせることによる訪問デモ測定も随時行っております (国内限定サービスとなっております)。

We also offer on-site CoolSpek demonstration at your facility. CoolSpek adaptation to your spectrometer for demonstration measurements is available. (only domestic)

Hydrogen-Sensitive Thermal Desorption Spectroscopy System
HEMTO-TDS
超高感度熱脱離分析装置

デモ測定受付中
※訪問及び来社実験は対応しておりません。

This is a demo measurement only
＊Visiting /in-house experiment service is not available.

試料導入室を備えたスタンドアロンの3室構成のシステムをデモ測定器として準備しています。本計測は大気中での水分吸着に敏感な可能性がありますので、試料の導入方法や測定内容については相談して進めさせていただきます。

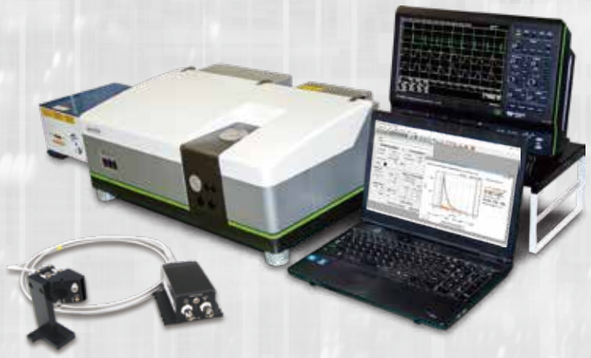
【Custom demo measurements】
We organize demonstration measurements of your samples using the HEMTO-TDS at our facility.
Contact us to discuss the details of the samples you are interested in!

picoTAS + TCSPC

ピコ秒過渡吸収分光 + 蛍光寿命コンバインシステム

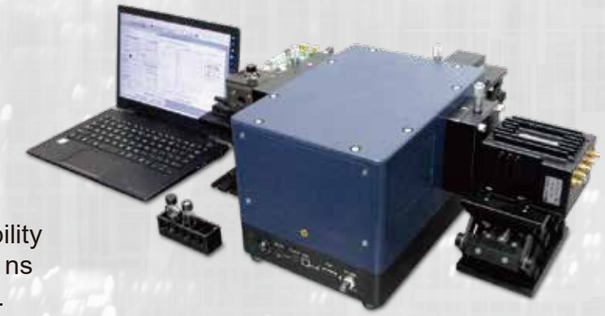
Combined System of Picosecond Transient Absorption and TCSPC Fluorescence Lifetime

World's First !



光化学「トピックス」に解説執筆
「中小企業優秀新技術・新製品賞」優良賞受賞
来社実験サービス in デモルーム　実施中

Our New Approach to TCSPC Brings New Possibility of Fluorescence Lifetime Measurement



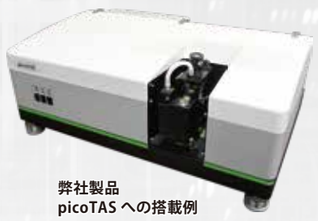
- ✓ Advantages of Unique Deconvolution Capability
- ✓ Challenge to NIR Emission Lifetime with < 1 ns
- ✓ Standalone TCSPC system is available now.

CoolSpeK SLIM

分光用薄型クライオスタット

Ideal for the spectrometer such as pump-probes system which uses 2 mm cuvette.
Built-in stirrer, Attacheble to picoTAS.

2 mmセルなどと用いるポンプ・プローブ用などに最適
picoTAS にも搭載可能、スターラー内蔵



弊社製品
picoTAS への搭載例

CoolSpeK Shipped Over 500 Units

CoolSpeK は出荷500台を突破

picoTAS-related Published Papers

Effect of Deuteration on Relaxation Dynamics of the Perylene Excimer Studied by Subnanosecond Transient Absorption Spectroscopy
Y. Shibasaki *et al*., J. Phys. Chem. A, **125**, 1359 (2021).

Dynamic Spin–Spin Interaction Observed as Interconversion of Chemical Bonds in Stepwise Two-Photon Induced Photochromic Reaction
K. Mutoh *et al*., J. Am. Chem. Soc. , **143**, 13917 (2021).

Extending the Lifetimes of Charge Transfer States Generated by Photoinduced Heterolysis of Photochromic Radical Complexes
Y. Kawanishi *et al*., Asian J. Org. Chem., **10**, 891 (2021).

Fast T-Type Photochromism of Colloidal Cu-Doped ZnS Nanocrystals
Y. Han *et al*., J. Am. Chem. Soc., **143**, 2239 (2021).

Light-Triggered Elimination of CO_2 and Absorption of O_2 (Artificial Breathing Reaction) in Photolysis of 2-(4-nitrophenyl)-1H-indole Derivatives
Q. Lin & M. Abe, Photochem. Photobiol. Sci., **20**, 421 (2021).

p-Nitroterphenyl Units for Near-Infrared Two-Photon Uncaging of Calcium Ions
T. T. T. Pham *et al*., J. Photochem. Photobiol. A , **409**, 113154 (2021).

Near-Unity Singlet Fission on a Quantum Dot Initiated by Resonant Energy Transfer
J. Zhang *et al*., J. Am. Chem. Soc., **143**, 17388 (2021).

Impact of the Macrocyclic Structure and Dynamic Solvent Effect on the Reactivity of a Localised Singlet Diradicaloid with π-Single Bonding Character
Z. Wang *et al*., Chem. Sci., **12**, 613 (2021).

Mechanistic Study of Photocatalytic CO_2 Reduction Using a Ru(ii)–Re(i) Supramolecular Photocatalyst
K. Kamogawa *et al*., Chem. Sci., **12**, 9682 (2021).

1,3-Diradicals Embedded in Curved Paraphenylene Units: Singlet Versus Triplet State and In-Plane Aromaticity
Y. Miyazawa *et al*., J. Am. Chem. Soc., **143**, 7426 (2021).

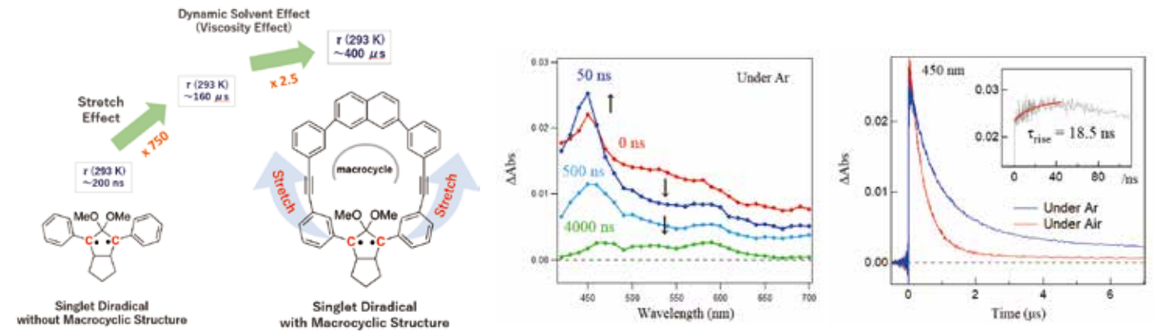
Impact of the Macrocyclic Structure on the Reactivity of a Localised Singlet Diradicaloid

Z. Wang *et al*., Chem. Sci., **12**, 613 (2021).

Dr. Zhe Wang

Prof. Manabu Abe

Localised singlet diradicals (S-DR) are key intermediates in bond homolysis processes, but elusive due to the fast radical–radical coupling reaction. Dr. Zhe Wang and Prof. Abe's group, Hiroshima Univ., computationally designed then synthesized a naphthalene-containing macrocyclic structure, S-DR3b, aiming "stretch effect" to realize extended lifetime of singlet diradicaloid. They intensively examined its character using laser flash photolysis system, TSP-1000 and picoTAS, CoolSpeK, and found that S-DR3b exhibited a low carbon–carbon coupling reaction rate about 1000 times slower than non-macrocyclic molecule. Furthermore, a significant dynamic solvent effect was observed for the first time in intramolecular radical–radical coupling reactions in viscous solvents.
This theoretical and experimental study demonstrates that the stretch effect and solvent viscosity play important roles in retarding the bond formation process and establishes a new strategy towards a deeper understanding of the character and reactivity of S-DR.



World Liquor Tour ~Distributor Selection~

各代理店がおすすめする地元のお酒をユニソク社員が試飲するイベントを勤務後に実施しました！

Tasting Event at UNISOKU (Europe, USA and Russia)

2021/12/27に実施しました。This event was held on 2021/12/27

White Ale
白ビール
https://www.allagash.com/beer/

Allagash White（アラガッシュホワイト）

Selected by SPECS-TII Inc.（USA・アメリカ）

Allagash White features a refreshing balance of citrus and spice (wheat, coriander, and Curaçao orange peel) that round out the flavor profile with little to no bitterness. Allagash White is best paired with savory dishes, including sushi, as it has just the right hint of complementary acidity. Allagash White also brings balance to the teriyaki-like flavors in eel rolls and can tone down the heat in spicy tuna rolls. The subtle bitterness of the beer allows, for many other flavors to shine!

アラガッシュホワイトはシトラスとスパイスのさわやかなバランスが特徴です。酸味が程よく効いているため、寿司などの料理と合わせるのがおすすめです。うなぎ寿司の風味とバランスをとり、スパイシーツナロールの辛さを和らげます。苦味が少ない分、他の味を引き立てます。

Sushi with Teriyaki-like Eel

Spicy Tuna Roll

Ice Wine
アイスワイン
https://www.lakeviewwineco.com/

20 Bees Vidal（20 ビーズ ヴィダル）

Selected by Worldwide Exchange LLC（USA・アメリカ）

20 Bees Vidal is an ice wine produced in the Niagara region with a rich golden color and a hint of apricot and citrus. It is a perfect match for the after-dinner cheesecake, Italian delight or just plain ice cream. 20 Bees Vidal is highly recommended to anyone who likes dessert wines—this one will not disappoint you and is even fully endorsed by the taster's cat. Cheers!

20 ビーズ・ヴィダルはナイアガラ地方で生産されるアイスワインです。黄金色で、アプリコットやシトラスの香りがします。食後のチーズケーキやアイスクリームにぴったりです。このワインはデザートワインが好きな人なら誰でも気に入るでしょう。期待を裏切りません。そして、我が家の猫のお墨付きです。乾杯！

Cheesecake
(Basque-style)

Ice Cream

Correlation Chart for Tasted Liquors 試飲したお酒の相関図

Tasted 1

Sparkling Wine
スパークリングワイン
https://en.abrau.ru/collection/

ABRAU DURSO Russian Sparkling Wine Brut（アブラウドゥルソ　ロシアンスパークリングワインブリュット）

Selected by SPECS-TII Russia（Russia・ロシア）

The Russian sparkling wine ABRAU DURSO, famous since 1870, is a product of the Black Sea coast, near the Sochi summer resort area, where excellent sparkling wine is produced. ABRAU DURSO is indispensable for wedding, birthday parties, or any special occasion. Just a one sip evokes the sparkling ocean view.

アブラウドゥルソは 1870 年以来とても有名なロシアのシャンパンで、夏のリゾート地であるソチの近くである黒海沿岸で生産されています。黒海のこのあたりはおいしい葡萄が取れるのでシャンパンやワインが作られていますが、結婚式や誕生日など特別な日にぴったりなのはやはりこのアブラウドゥルソでしょう。海を眺めながら友人とのパーティー、ロシア料理を楽しみながらのアブラウドゥルソ。都会でも一口飲めば夏の太陽にきらきら輝く南国の海が目の前に広がってきそうです。

Comment (UNISOKU)：
A sparkling wine with rich aroma and a sophisticated taste profile
香り豊かで味わいは穏やかなスパークリングワイン

Food paring suggestions おすすめのおつまみ：
Apetizers with olives and Ajillo
オリーブをつかったピンチョス　アヒージョ等

Apetizers with olives

Ajillo

Tasted 2

Wine
ワイン
https://www.august-ziegler.de/

August Ziegler Scheurebe（アウグスト・ツィーグラー：ショイレーベ　2018 年）

Selected by nanoscore gmbh（Germany・ドイツ）

The August Ziegler Winery offers a wide range of wines, from sweet wines that once flourished to dry wines that pair well with food. The Scheurebe is one of the refreshing sweet wines.

アウグスト・ツィーグラーはかつて隆盛を誇った甘口ワインから食事に合う辛口ワインまで、幅広く揃うワイナリーです。爽やかな甘味が特徴なワインです。

Comment (UNISOKU)：
Fresh, rich in aroma of grapes and sweet tasting wine
爽やかな青い葡萄の香り豊かな甘口ワイン

Food paring suggestions おすすめのおつまみ：
Mild cheeses (ricotta cheese),
non-aged goat cheese, or Bavaria Blu
マイルドな味わいのチーズ
（リコッタチーズ, 若い(Non-aged)シェーブル, カンボゾーラ）

Ricotta Cheese

Goat Cheese
(Fromage au lait de chèvre)

Cambozola
(Blue Brie)

World Liquor Tour ~Distributor Selection~

各代理店がおすすめする地元のお酒をユニソク社員が試飲するイベントを勤務後に実施しました！

Tasting Event at UNISOKU (East Asia)

2021/12/27に実施しました。This event was held on 2021/12/27

Tasted 3

Huangjiu（黄酒）塔牌本美（もち米ワイン）

Selected by SPECS-TII Technology (Beijing) Co., Ltd.（China・中国）

Shaoxing Yellow Wine
紹興黄酒
http://www.tapaijiu.com/index.php/Index/show/tid/37

Huangjiu (Chinese: 黄酒) is a Chinese yellow wine with a 2,500 year-long history. Chinese people believe yellow wine is a healthy drink because of its low alcohol content and high amount of amino acids. In traditional Chinese medicine, yellow wine is sometimes used to enhance the efficacy of other remedies. Huangjiu is also used to season many Chinese dishes and is an especially good combination with hairy crabs.

チャイニーズイエローワインとして知られる黄酒は、2500 年以上の歴史を持つ中国のアルコール飲料です。中国の人々は、黄酒はアルコール含有量が少なく、アミノ酸が多いため、健康的な飲み物であると信じています。黄酒は飲むだけでなく中国料理に欠かせない調味料でもあります。特に毛ガニとの相性は抜群です。

Comment (UNISOKU)：
Soy sauce or caramel like toasty and slightly sweet tasting liquor during meals
ほんのりとした甘味と醤油やカラメルのような香ばしさを併せ持つ食中酒

Food paring suggestions おすすめのおつまみ：
Sweet and sour dishes like sweet and sour pork or soy-braised pork　酢豚等甘酢系、豚角煮

Sour Pork

Soy-Braised Pork

Tasted 4

Buckskin MUNICH HELLES（バックスキン・ミュンヘンヘレス）

Selected by Shumotek Corp.（Taiwan・台湾）

Lager beer
下面発酵ビール（ラガー）
https://www.buckskin.com.tw/

The Buckskin Schwarzbier is bitter-flavored and the Heferweizen tastes fine, but the one in the between is even better:
The Munich Helles, with its refreshing barley fragrance, can match almost any food type, whether it is low-calorie light foods such as sautéed scallops, poached eggs, salads, or sandwiches. It even complements French fries, Tang Yang chicken/pork chops and other deep-fried foods.

Buckskin シリーズの黒は苦すぎるし飲みやすさが際立つ青もいいのですが、その２つの真ん中のミュンヘンヘレスが更に良いです。ミュンヘンヘレスは麦の香りが豊かでどんな料理にも合います。ホタテのソテー、ポーチドエッグ、サラダ、サンドイッチなどの低カロリーのライトな食事から、フライドポテト、唐揚げ、ポークチョップなどの揚げ物の油っぽさを中和するのにもおすすめです。

Comment (UNISOKU)：
Pleasant clean finish!　酸味が効いたごくごく飲めるビール

Food paring suggestions おすすめのおつまみ：
Classic sausage, Roasted pork　ソーセージ・豚のロースト

Sausage

Roasted pork

Tasted 5

Makgeolli in Pocheon（抱川のマッコリ）

Selected by Lambda Ray Co., Ltd.（Korea・韓国）

Makgeolli
マッコリ

Makgeolli is most suitable for casual parties, often with Korean pancakes.
カジュアルな食事の場面にて、チヂミやピンデトッ (韓国風おやきのようなもの) と共に。

Comment (UNISOKU)：
Sweet, melting, tastes like lactobacillus beverage
甘口でまったりとした、乳酸飲料のように気軽に飲めるお酒

Food paring suggestions おすすめのおつまみ：
Sea food Korean pancake　海鮮チヂミ

Sea food Korean pancake

Tasted 6

Mowall（モウォール）

Selected by INA Korea Co., Ltd.（Korea・韓国）

Soju
韓国焼酎
https://www.mowall.co.kr/

The Mowall won the 2020 liquor of the year Presidential Award.
The Mowall taste profile is layered with a moderate sweetness, savory and slightly dry feeling.
It is a distilled soju that pairs well with all food, so it's good to drink for all occasions.

2020 年に韓国酒品評会で最高賞の大統領賞を受賞。適度な甘みと香ばしさ、ややドライ感が重なった味わい。どんな料理とも相性が良い蒸留焼酎なので、場面問わず飲むことができます。

Comment (UNISOKU)：The taste is like a mixture of fine flavors without peculiarities, with a smooth throat feel and a rich aftertaste.
クセのない上等な風味をいくつか混ぜ合わせたような味わいで、喉越しもよく後味も豊か。

Food paring suggestions おすすめのおつまみ：
Sashimi, tempura, and other Japanese dishes.
刺身、天ぷらなど和食なら何にでも

Tempura

Sashimi

Tasted 7

Usui UI Kimoto-Junmai（羽水 ui 生酛純米）

Selected by UNISOKU Co., Ltd.（Japan・日本）

Sake
日本酒
http://senkin.co.jp/

Usui UI is an improved sake from the original brand, USUI in Senkin Shuzo located in Tochigi prefecture. The use of the most traditional brewing technique, Kimoto, brings the unique taste that maximizes sweetness and sourness.

栃木県にある仙禽酒造のブランドのひとつ「羽水」をリニューアルした日本酒。最も伝統的な酒造り技法とされる生酛造りを採用し、甘みと酸味を最大限に引き出した個性的な味になっています。

Comment (UNISOKU)：
Both umami and sweetness stand out, with a clean aftertaste.
旨味と甘みも持ち合わせた後味スッキリな日本酒

Food paring suggestions おすすめのおつまみ：
Daily Japanese foods like Oden, Sweet dishes like Inari sushi or potato salad are very good.
おでん等気負わない和食・イナリやポテサラ等少し甘味の料理でもいいかも

Oden

Inari Sushi

Potato Salad

Tasted 8

KUROUMA taru 40%（黒馬　樽）

Selected by UNISOKU Co., Ltd.（Japan・日本）

Shochu
焼酎
https://www.kagurashuzo.co.jp/taru/

This is a six years old barley shochu from Kagura Shuzo in Miyazaki prefecture. The barley shochu breathes and matures in barrels little by little in the clean air of Miyazaki's Takachiho, resulting in a gentle sweet flavor and a rich and mellow taste profile. It is filtered at a temperature of -20 degrees to bring out its clear aroma, producing a lingering smoothness and a luxurious 40% alcohol content.

宮崎県神楽酒造による６年樽貯蔵焼酎を基調とした長期貯蔵酒。樽貯蔵に最適な麦焼酎を宮崎 高千穂の澄んだ空気の中で少しずつ呼吸させながら熟成を重ね、おだやかな甘い風味、そして芳醇でまろやかな味わいとなりました。さらに原酒を氷点下 20 度で濾過することにより、澄みきった芳香を引き出すことができました。余韻の滑らかさ贅沢なアルコール分 40 度で味わう逸品です。

Comment (UNISOKU)：
Slightly sweet and gently barrel scented barley shochu. Recommended for enthusiasts of Japanese whiskies, which have recently become popular worldwide and difficult to find. This might become its substitution.
ほんのり甘く穏やかな樽香を持った麦焼酎。ジャパニーズウィスキー好きにもお薦め。今、世界的に大人気かつ入手困難なのでウィスキーの代わりに飲むのも面白いかもしれません。

Food paring suggestions おすすめのおつまみ：
(If it's on the rocks)
Nuts, Baked sweets or Salted rice crackers
(ロックなら)ナッツ, 焼き菓子, 意外に塩味のあられも

Nuts

Baked sweets

Salted rice crackers

Where to Contact in Your Area

代理店紹介

■ SPM, ■ Optics, ■ SPM & Optics

UNISOKU has great distributors to take care of your inquiries in your area.

EUROPE／ISRAEL／NORTH AFRICA

nanoscore GmbH

Maisebachstraße 3, 61479 Glashütten, Germany
TEL +49 (0) 6174-619-950
FAX +49 (0) 6174-619-949
t.berghaus@nanoscore.de
www.nanoscore.de

CHINA

SPECS-TII Technology (Beijing) Co., Ltd.

Room 418A, Building 39, 4
Workers Stadium North Rd,
Chaoyang District, Beijing 100027, P.R.China
TEL +86-10-65010355
sales@specs-tii.com.cn
www.specs-tii.com.cn

INDIA

Anarghya Innovations & Technology Pvt. Ltd.,

#32, 7th A Main Road, Muthyalanagar,
Mathikere, Bengaluru, Karnataka – 560054 India.
Tel: +91-80-23376488,
Fax: +91-80-23375606,
Cell & WhatsApp: +91-9845019130
sales@anarghyainnotech.com
www.anarghyainnotech.com

TAIWAN

SHUMOTEK CORP.

No. 111, Jiabei 1st St. Zhunan, Miaoli County 35058, Taiwan
TEL +886-37-612810 (Office), +886-919-706759
febchangs@gmail.com
info@shumotek.com
www.shumotek.com

CANADA／USA／MEXICO

SPECS-TII Inc.

20 Cabot Blvd., Suite 300
Mansfield, MA 02048 USA
TEL +1-508-618-1292
usa@specs-tii.com
www.specs-tii.com (Coming Soon)

Worldwide Exchange LLC

P. O. Box 1559
Princeton, NJ 08542
info@wwe-us.com
www.wwe-us.com

SOUTH KOREA

INA Korea Co., Ltd.

12F, 110 Mallijae-ro, Mapo-gu,
Seoul, 04184 Korea
TEL +82-2-714-5456
FAX +82-2-714-5457
shpark@inakr.com
www.inakr.com

Lambda Ray Co., Ltd.

55-16, 247beon-gil, Mabuk-ro,
Giheung-gu,Yongin-si,
Gyeonggi-do, 16891 Korea
TEL +82-31-693-5776
FAX +82-31-284-6089
jayjeong@lambdaray.co.kr
www.lambdaray.co.kr

For customers outside those areas, contact UNISOKU directly. Mail: info@unisoku.co.jp

Events 学会・展示会情報

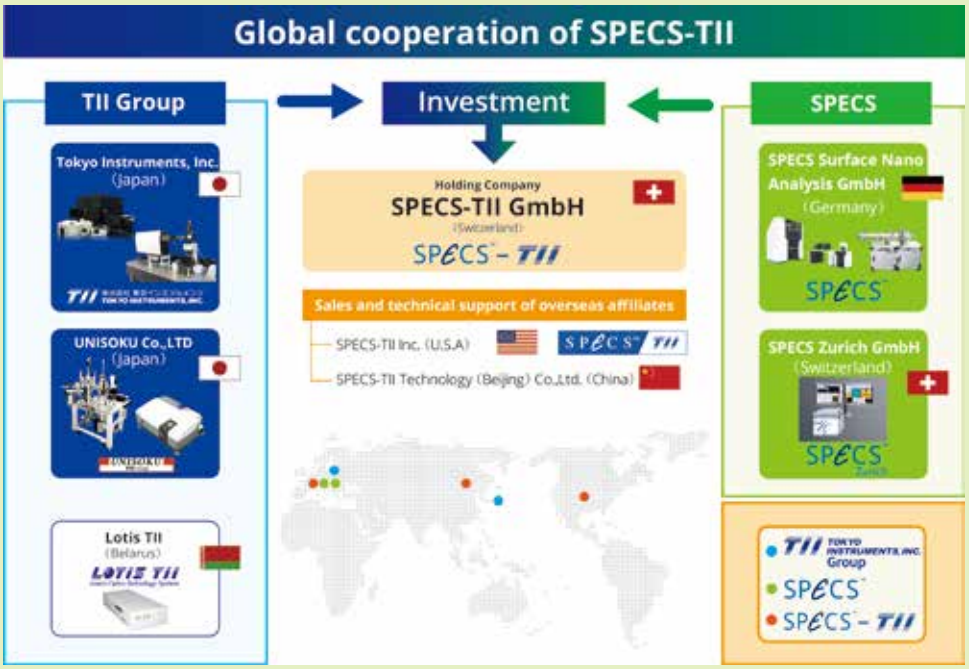
unisoku.co.jp

unisoku.com

UNISOKU TII Group

UNISOKU Co., Ltd.

Web site: http://www.unisoku.com/
E-mail: info@unisoku.co.jp
2-4-3 Kasugano, Hirakata, Osaka 573-0131 Japan
TEL +81-72(858)6456 FAX +81-72(859)5655



20220411

Editor ; Riku Shibuya(Chief), Yoshihide Sano, Natsuya Inaya, Nozomi Nishiyama, Hiroko Fusadate, Chiaki Sawada