2025 UNISOKU NEWSLETTER

Front: Beppu Onsen - Oita (Umi Jigoku), Back : Kujyu Flower Garden Park　表：大分県・別府温泉(海地獄)、裏：くじゅう花公園(阿蘇くじゅう国立公園)

社長挨拶

Message from the CEO

2025 is the year of the Snake in the Japanese zodiac.

創業の原点

ユニソクは 50 年前、創業者である初代社長・長村俊彦の「研究者一人ひとりのニーズに寄り添った計測器を提供する」というビジョンのもと、自動旋光計測器や光散乱計の製造販売を開始しました。当初の事業から次々に挑戦を重ね、過渡吸収分光装置の開発、さらには創業から１０年を迎えた頃にお客様からのご相談を契機に、当時新しい技術であった STM(走査トンネル顕微鏡) の製造に取り組みました。

これらの製品は今ではユニソクの主力製品として多くの研究者の方々にご愛用いただいております。

The Origin of Our Foundation

Fifty years ago, UNISOKU was founded under the vision of our first president, Toshihiko Nagamura, to provide measurement instruments tailored to the needs of individual researchers. Starting with the manufacturing and sales of Automatic Polarimeters and Light Scattering Photometers, we continually took on new challenges. Among these efforts were the development of Transient Absorption Spectroscopy systems and, around our 10th anniversary, a pivotal moment when a customer's inquiry inspired us to begin manufacturing STM (Scanning Tunneling Microscopy) systems, a groundbreaking technology at the time. Today, these products have become core offerings of UNISOKU, trusted and widely used by researchers around the world.

成長の軌跡

創業から現在に至るまで、私たちは常に「研究者のニーズに寄り添った計測器」を作り続け、そのためのカスタマイズを重要視してまいりました。この間には多くの試行錯誤がありましたが、常に温かいご支援をいただきながら何度も挑戦を繰り返し、その度に成長を遂げることができました。心から感謝申し上げます。

大気中 STM、USM-101
(1986)

コックレス自動ミキサー
(1999)

Our Journey of Growth

Since our founding, we have remained steadfast in our commitment to creating measurement instruments that meet the needs of researchers, placing great importance on customization. During this period, we have faced numerous challenges and engaged in countless trials and errors. Thanks to your unwavering support, we have embraced these challenges as opportunities to grow, repeatedly striving to improve and evolve. I would like to express my sincere gratitude to all of you.

新たなスタートとシナジー

2010 年、ユニソクは東京インスツルメンツから駿河正次氏を社長として迎え、TII グループの一員となりました。この新たなスタートを切ったことで TII グループとのシナジーが生まれ、例えば TERS 装置など共同開発による新たな製品も誕生しました。また、品質向上を目指して工場の新設を行い、製品開発のスピードを加速させて新たなステージへと進化を遂げました。

A New Beginning and Synergy

In 2010, UNISOKU embarked on a new chapter by welcoming Shoji Suruga from Tokyo Instruments as president and becoming part of the TII Group. This fresh start fostered synergy with the TII Group, leading to the joint development of innovative products such as TERS systems. Additionally, with the aim of enhancing quality, we established a new factory, accelerating the pace of product development and propelling us to a new stage of growth and evolution.

多彩なラインアップ

現在、過渡吸収装置では、計測手法の異なる 3 つのモデルをラインアップし、低温 STM 装置においては、商用 UHV 装置として世界最低温度の 40 mK モデルからヘリウムフリー装置まで計 6 種のモデルを提供できるようになりました。また、こうしたラインアップ製品とは別に、特殊な計測器の試作や計測環境の提供などをご相談いただき、提供しております。

お客様との共創

私たちの製品やサービスは、お客様の声に真摯に耳を傾け共に歩みながら進化してきました。
いただいたフィードバックは私たちにとっての原動力となり、そのおかげでこれまで数多くの成果を上げることができました。今後も挑戦を恐れず革新を追求しながら、皆様の期待を超える成果を提供し続けていく所存です。お客様の信頼に応えることに誇りを持ち、共に成長していけることを心から楽しみにしています。
また、これまでの成長を支えてくれた取引先や従業員の皆様にも深く感謝の意を表します。彼らの努力と情熱が、今のユニソクを形作り、私たちの基盤となっています。彼らが築いた礎の上に新たな価値を創造し、さらに発展させていくことをお約束いたします。

Diverse Product Lineup

Today, our lineup of Transient Absorption Spectroscopy systems includes three models, each offering distinct measurement methods. In the realm of low-temperature STM systems, we provide six models, ranging from the world's lowest-temperature commercial UHV system at 40 mK to liquid-helium-free systems. In addition to these standard product lines, we also offer bespoke solutions, including prototyping specialized measurement instruments and creating tailored measurement environments based on customer requests.

Co-creation with Our Customers

Our products and services have evolved through listening attentively to the voices of our customers and working together with them. The feedback we've received has been the driving force behind our progress, allowing us to achieve numerous successes. As we move forward, we will continue to embrace challenges, pursue innovation, and strive to exceed your expectations. We take great pride in meeting the trust you have placed in us, and we look forward to growing together with you.
I would also like to express my deep gratitude to our business partners and employees who have supported our growth. Their dedication and passion have shaped UNISOKU into what it is today and formed the foundation of our success. Building on the strong foundation they have laid, we are committed to creating new value and continuing to evolve.

未来に向けて

私たちは変化を恐れず、絶え間ない挑戦を続けていきます。
最後になりますが、これまでのご愛顧に心から感謝申し上げ、今後とも変わらぬご支援を賜りますようお願い申し上げます。次の 50 年も、皆様と共に歩んでいけることを心より願っております。

代表取締役　宮武 優

Looking Toward the Future

As we look to the future, we will continue to embrace change and relentlessly pursue new challenges.
In closing, I would like to express my sincere gratitude for your continued support and trust. We ask for your ongoing patronage as we move forward, and we truly hope to walk alongside you for the next 50 years.

Yutaka Miyatake

創立50周年特集
ユニソクを形作った技術革新

50th Anniversary Special
Technological Innovations That Shaped UNISOKU

① UHV-High Magnetic Field ^{3}He-Refrigerator Based STM System
超高真空・強磁場^{3}He冷凍機STM
USM1300

Shipped the first system in 2002 (to Prof. Kobayashi's lab at Tohoku Univ. and Prof. Kitazawa's lab at the Univ. of Tokyo).
2002年1号機出荷(東北大小林研と東大北澤研)

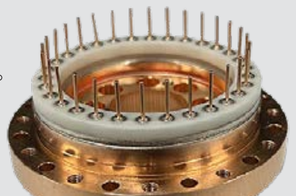
To date, 146 systems have been shipped, making it a best-selling STM system.
これまで146台出荷のベストセラーSTMシステム

Key factors that led to improvements in performance
性能改善の主な要素 ▶▶▶

Electrical Wiring Terminal
中継端子

A terminal that would not leak even after repeated low-temperature cooling was required.
However, frequent leaks occurred initially.
After much trial and error, improvements were successfully made in 2008.

繰り返し低温冷却してもリークしない電流導入端子が必要。
しかし当初は頻繁にリークが発生した。
試行錯誤の末、2008年に改善に成功。



Current electrical wiring terminal
現在の中継端子

Radiation Shutter
輻射シャッター

Prof. Yukio Hasegawa (Univ. of Tokyo) pointed out that a single shutter was insufficient to cool the sample. Test experiments were conducted using Prof. Fujita's system at NIMS, leading to the adoption of two shutters in June 2004. Currently, three shutters are being used.

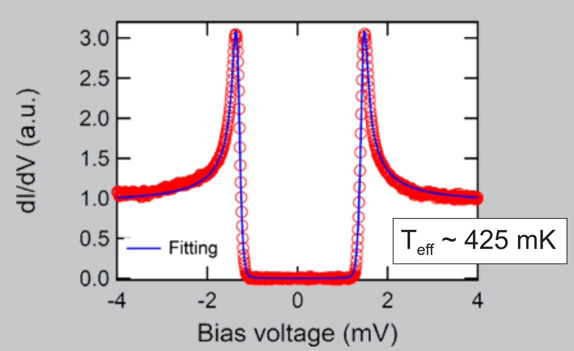
東京大学長谷川幸雄先生からシャッター1箇所ではサンプルが冷えていないとご指摘いただき、NIMS藤田先生の装置で検証実験を行って2004年6月から2箇所に採用。
現在は3箇所に使用し、電子温度 ～425 mKを達成。


@Sorption pump


@1K pot


@^{3}He pot

Superconducting gap of Pb



② Picosecond Transient Absorption Spectroscopy System
ピコ秒過渡吸収分光システム
picoTAS

The development history of our RIPT method, which enables measurement across a broad time range from 100 ps to ms, including the 'gap time' of conventional methods (1 ns to several tens of ns).

従来法の'すきま時間'(1ナノ秒から数10ナノ秒)を含む100ピコ秒～ミリ秒の広い時間域を測定可能とした独自技術(RIPT法)の開発ヒストリー

May 2011: Conceived the principle　原理を考案

May 2013: Conducted proof-of-concept experiments using borrowed equipment, but the issue of fluorescence contamination made us stuck once
機器を借りて原理実証実験を行うが問題発覚(蛍光混入)

Aug. 2013: In-house development application rejected
社内開発申請却下

Feb. 2014: In-house patent application request denied
社内特許申請願い却下

May 2014: Broke through the issue of fluorescence contamination and filed a patent application
蛍光混入問題を解決して特許出願(**Figs. 1, 2**)

Nov. 2014: Selected for the JST Advanced Measurement Program　JST先端計測プログラム採択

Feb. 2015: Sold the first prototype system, RIsPekT
プロトタイプ機RIsPekT 1号機販売(**Fig. 3**)

Mar. 2016: Published a paper featuring the world's first data and highlighted in Science and Nature Photonics　世界初のデータとともに論文が掲載され、ScienceとNature Photonics がハイライト
(Nakagawa *et al.*, Opt. Lett. **41**, 1498 (2016).)

Sep. 2017: Launched sales of picoTAS
picoTAS完成、販売開始(**Fig. 4**)

Mar. 2019: Invention Merit Award (the 44th Invention Award)
第44回(2018年度)日本発明大賞 発明功労賞を受賞

Apr. 2021: Distinguished Achievement Award (the 33rd Small and Medium Enterprise Excellence Award for New Products and New Technology)

Fig.1 Achieved 100 times better temporal resolution (Early Data)
時間分解能 100 倍を実証!(初期のデータ)

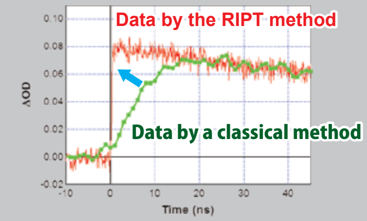


Fig.2 Solved the problem of fluorescence contamination(Early Data)
蛍光混入問題を解決!(最初のデータ)

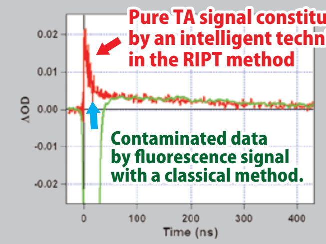


Fig.3

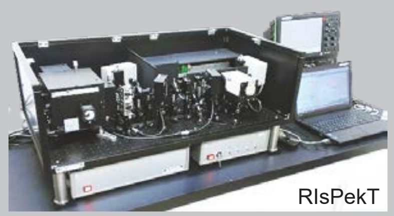

RIsPekT

Fig.4


picoTAS

③ Construction of the Second Factory
第二工場建設

Completed in July 2016.
2016年7月完成

At a time when annual SPM orders had just barely exceeded 1 billion yen,
and the future was still uncertain, former President Suruga decided to proceed with the construction, investing 100 million yen (at the time). This greatly improved production capacity and enabled thorough in-house testing before shipment.

SPM受注が年間10億円をようやく超えたばかりでまだ先行きが不安な中1億円(当時)の建築費を掛けて駿河前社長が建築を決意
生産能力が格段に向上し、出荷前の十分な社内テストを可能にした




Factors Behind Its Long-Lasting Success
ロングセラーの要因

1. Lightweight and compact design, easy operation, and a wide range of options
   軽くて小さい、操作が簡単、豊富なオプション
2. Compatible with ~60 models of spectrometers from 12 manufacturers
   12メーカー約60種類の分光計に対応
3. Recommendations among researchers 研究者間の口コミ
   - Prof. Shinobu Itoh, Osaka Univ. (chemist in the field of coordination chemistry., formerly, Osaka City Univ.) devised a new method for measuring reaction rates at low temp. by adopting CoolSpeK.
   大阪大学の伊東忍先生（錯体化学、当時大阪市立大学）がCoolSpeKを利用して低温で反応速度を測定する新手法を考案

A Trigger for Overseas Expansion
海外進出のきっかけ

In October 2001, with the cooperation of Prof. Itoh, the 1st unit was delivered to Prof. Lawrence Que, Jr. at the Univ. of Minnesota.
2001年10月、伊東先生のご協力のもと、ミネソタ大学のLawrence Que, Jr.研究室へ納品

Many researchers trained in that lab. later adopted CoolSpeK, that led to its worldwide use.
同研究室で研鑽を積んだ多数の研究者が、その後CoolSpeKを導入
これによりCoolSpeKが世界中で使用されるようになった

Cryostat for Spectrophotometer
分光用クライオスタット
CoolSpeK

A long-selling product launched in the late 1990s, with a total of 615 units sold to date.
1990年代後半に販売開始、累計販売台数615台のロングセラー製品

New Model (2020~)
Changed to worldwide voltage input (100-240V)
電源をワールドワイド入力(100-240V)に変更

By Prof. Yoshihisa Inoue, Osaka Univ. (chemist in the field of photochemistry) CoolSpeK with special side windows made it possible to perform low-temp. measurements of circular dichroism spectra in the ultraviolet region, which had previously been challenging.
大阪大学の井上佳久先生（光化学）がそれまで困難だった紫外領域での円二色性スペクトル低温測定を特殊窓を用いたCoolSpeKにより可能にした

Prototype (1990)

Revision-1 (2004~)

Internal Heater added
内部ヒーター追加

Revision-2 (2006~)

Smart design by neat cables
配線をすっきりさせて
よりスマートなデザインに

Derived model for CD/Raman (2011~)

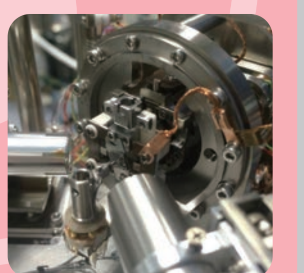
Enlarged and distortion-free side windows
窓を歪みのない大きなものに

Derived model for picoTAS (2021~)

Designed for 2 mm cuvette equipped with stirrer
2mm セルに対応
スターラーも装備

Challenge to TERS (Tip-Enhanced Raman Spectroscopy)
TERSへの挑戦

The development was initiated by a request from Prof. Dong (Univ. of Science and Technology of China), and involved tackling various developments such as a movable lens stage and a lower tank STM.
After gaining experience in measuring Raman signals with TII's Nanofinder, we successfully detected clear TERS signals.
開発のきっかけはDong先生(中国科学技術大学)からの要望、可動レンズステージ、下タンクSTMなど、多くの要素開発に挑戦
TIIのNanofinderでラマン信号を自分たちで測るという経験を経て、明確なTERS信号の検出に成功

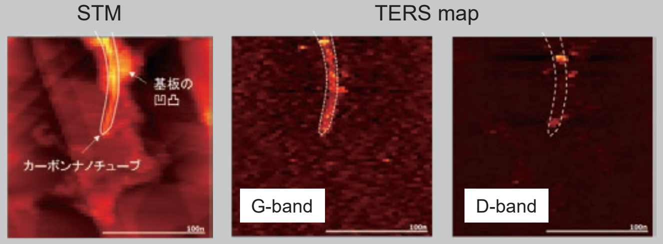


2013-2015: Conducted joint research with Kwansei Gakuin Univ. as part of the JST A-Step program
関西学院大学との共同研究でJST A-Stepを実施

2015: Commercialized the 1400 TERS
1400 TERSを製品化

2017: Received the Excellent Award at the 29th "Small and Medium Enterprises Excellent New Technology /New Product Award"
第29回「中小企業優秀新技術・新製品賞」優秀賞受賞

Initial STM-TERS measurement of carbon nanotube



Development of Liquid Helium-Free SPM
液体ヘリウムフリーSPM開発

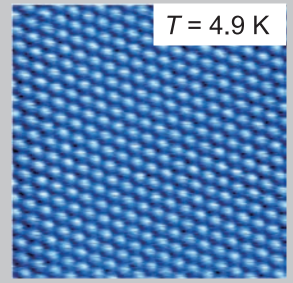
2018: Development began in response to recent concerns over helium supply instability and rising prices.
近年のヘリウム供給不安、価格高騰を背景に開発開始

2022: UNISOKU published its first independent academic paper.
ユニソク初の単独での学術論文出版
J. Kasai *et al.*, Rev. Sci. Instrum. **93**,043711(2022).

2023: Received the Excellent Award and the Environmental Contribution Special Award at the 35th "Small and Medium Enterprises Excellent New Technology/New Product Award."
第35回「中小企業優秀新技術・新製品賞」優秀賞・環境貢献特別賞を受賞

2024: The first preprint published by a customer
顧客による初のプレプリント発表
Y. Wang *et al.*,arXiv:2411.10644

The visit to Cryogenic Inc. led to the adoption of PTFE bellows (November 2018).
PTFEベローズ採用のきっかけになったクライオジェニック社訪問



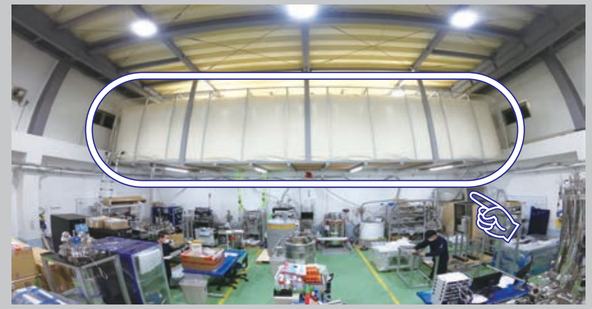
The first atomic-resolution STM image from the prototype system (April 2019)
プロトタイプ機初の原子分解能STM像

Construction of The In-house Helium Liquefaction System
社内ヘリウム液化装置建設

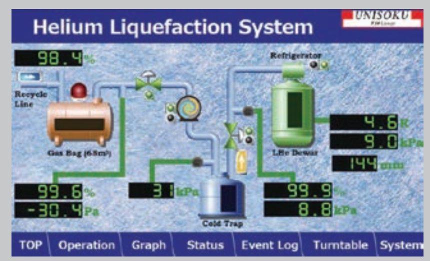
July 2019: The project began in response to recent concerns over helium supply instability and rising prices. 近年のヘリウム供給不安、価格高騰を背景にプロジェクト開始

April 2020: The system began operation, enabling enhanced in-house testing and improved efficiency.
稼働開始。これにより社内テストの充実、高効率化を実現

As of the end of December 2024, the total amount of liquefied helium is ~ 29,000 liters.
The current liquefaction rate is 50L/day.
2024年12月末時点で累計液化量は約2万9千リットル
現在は50L/dayの液化レート



Helium gas bag installed in the Second Factory
第二工場内に設置されたヘリウムガスバッグ（画面上部）



Control panel screen of the liquefaction system
液化装置のコントロールパネル画面

Publication of UNISOKU NewsLetter
ユニソクNewsLetter刊行

When visiting Prof. Vidya Madhavan at the University of Illinois, she expressed concerns about UNISOKU in such a distant location and her desire to stay informed about the company's recent developments.
This led to the launch of the UNISOKU NewsLetter in 2016.
Since then, it has become a valuable sales resource, collecting the latest technologies and customer information.
Following its publication, orders have seen significant growth.

イリノイ大Vidya Madhavan先生を訪問したとき、先生が遠く離れた地でユニソクの近況を知りたいとの意見から2016年スタート
今では最新の技術と顧客情報を集めた貴重な営業資料になっており
刊行以降、受注額が飛躍的に増加

2024 Yearly Events 2024年 年間イベント

Conference Presentations / Exhibition / Awards
学会発表/展示/受賞 関連

1 Jan.
- Dr. Nakagawa reappointed to the board of directors of the Japanese Photochemistry Association
  - 中川が光化学協会の理事再任

3 Mar.
- The 104th CSJ Annual Meeting (2024) <千葉県船橋市>
  - 日本化学会 第104春季年会(2024)
- Dr. Seino gave a luncheon seminar at NanospecFY2023 (NIMS) <愛知県岡崎市>
  「Scanning Probe Microscopy with Special Environment & Customized Products」
  - NanospecFY2023にて清野がランチョンセミナーを実施
- The 13th Japan-China Cluster Conference <東京都文京区>
  - 錯体化学会主催の第13回日中クラスター会議に出展

4 Apr.
- Received the 36th Small and Medium Business Excellence Award
  - 第36回中小企業優秀新技術・新製品賞にて優秀賞と産学官連携特別賞を受賞（時間分解走査トンネル顕微鏡）

7 Jul.
- China SPM 2024 <中国・雲南省昆明市>
- Dr. Miyatake gave a presentation at Seminar on Practical Microscopic Evaluation Technology 2024 <東京都文京区>
  - 宮武が日本表面真空学会 関東支部 実用顕微評価技術セミナー2024 にて企業プレゼンを実施
- IPS-24 and ICARP-2024 <広島県広島市>
  - 第 24 回 太陽エネルギーの光化学的変換と貯蔵に関する国際会議（IPS-24）および人工光合成国際会議 2024（ICARP-2024）に出展

9 Sep.
- Annual Meeting on Photochemistry 2024 <福岡県福岡市>
  - 2024年光化学討論会に出展
- PIRE “JUNCTION” Work Shop Poster Exhibition <神奈川県横浜市>
- The 74th Conference of Japan Society of Coordination Chemistry <岐阜県岐阜市>
  - 錯体化学会第74回討論会に出展

10 Oct.
- ISSS-10(The 10th International Symposium on Surface Science) <福岡県北九州市>
  - ISSS-10に出展及びHeinrich Rohrer Medalに協賛

11 Nov.
- Dr. Iwaya gave a presentation at Practical Surface Analysis Seminar 2024 <兵庫県神戸市>
  「Next-generation time-resolved scanning probe microscopy」
  - 岩谷が日本表面真空学会 関西支部「実用表面分析セミナー2024」にて発表
- At ALC24(15th International Symposium on Atomic Level Characterizations for New Materials and Devices '24)<福岡県北九州市>, Dr. Iwaya gave an invited talk, while Dr. Miyatake conducted a luncheon seminar
  - ALC24にて、岩谷が招待講演、宮武がランチョンセミナーをそれぞれ実施
- Dr. Yokota gave a poster presentation at ICSPM32 <北海道札幌市>
  「Optical pump-probe SPM and transient absorption spectroscopy measurements of exciton dynamics in bulk WSe_2」
  - 横田が第32回走査型プローブ顕微鏡に関する国際コロキュウムにてポスター発表

12 Dec.
- Dr. Nakagawa received The Chemical Society of Japan Award for Technical Achievements for 2024
  - 中川が日本化学会「第43回化学技術有功賞」を受賞（RIPT 法の考案と応用）

Annual Meeting on Photochemistry 2024
2024年光化学討論会

The 74th Conference of Japan Society of Coordination Chemistry
錯体化学会第74回討論会


ALC24

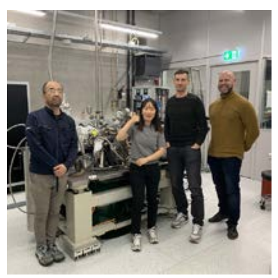

Received the 36th Small and Medium Business Excellence Award
第36回 中小企業優秀新技術・新製品賞 受賞

Products Related Delivery Records
製品関連/納品実績

2 Fab.
Delivered the first USM1800 in Europe (DIPC)
ヨーロッパで初めてUSM1800を納入

3 Mar.
Delivered the first CoolLinK
CoolLinK 初採用機を納品

7 Jul.
Delivered the first STM system in Switzerland (EMPA)
スイスで初めてSTMのシステムを納入

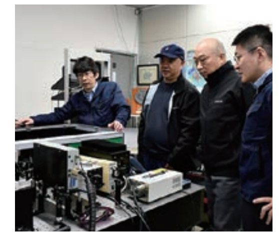

Installation at EMPA in July
7月EMPA納品にて

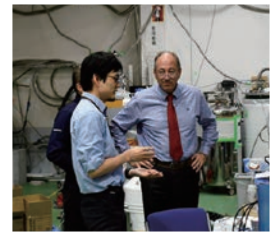
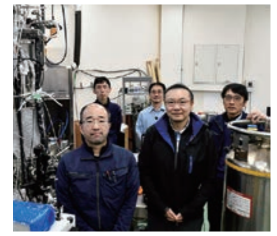
Visitors
ユニソクへ来社された方々(デモ実験除く)

5 May
nanoscore tech GmbH
ナノスコアテック社（ヨーロッパ、イスラエル、北アフリカ地域代理店）の方

11 Nov.
SPECS-TII Inc.
SPECS-TII社（カナダ、アメリカ、メキシコ代理店）の方々
Prof. Nan Jiang from University of Illinois Chicago
イリノイ大学 Nan Jiang先生

12 Dec.
Cryogenic Ltd.
技術相談のためイギリス・クライオジェニック社の方
Shanghai Hengyixing Technology Ltd.
分光製品中国代理店の方々

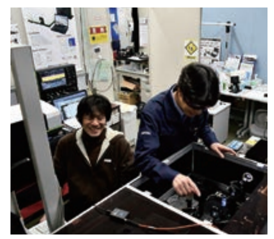
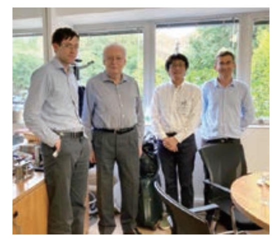



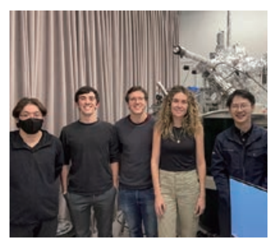
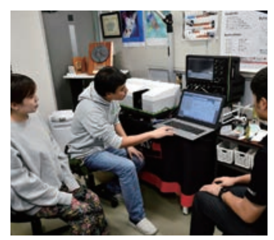
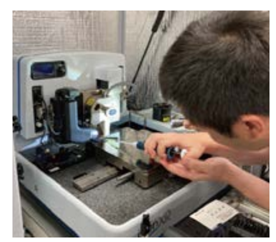




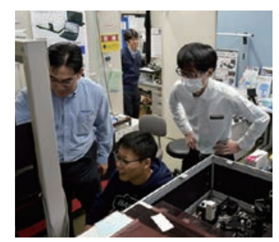

Media Publishing
メディア掲載関連

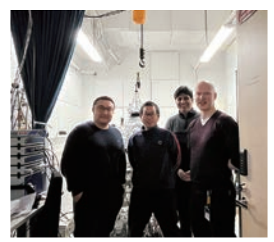
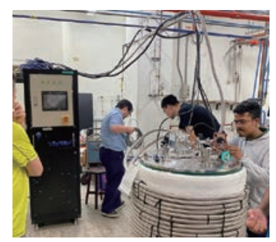
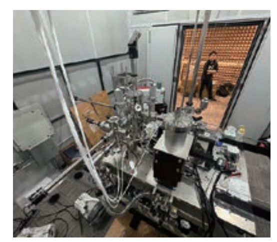
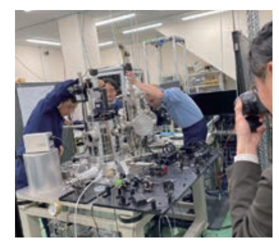
- Published in Nikkan Kogyo Shimbun: 36th Small and Medium Enterprise Excellence Award for New Products and New Technology/Award Winners' Roundtable Discussion
  - 日刊工業新聞掲載：第36回 中小企業優秀新製品・新技術賞／受賞者座談会
- Published in Nikkan Kogyo Shimbun: The backstage of the development
  - 日刊工業新聞掲載：開発の舞台裏
- Published in JSTnews Jan 2024 - JSTnews 2024年1月号に掲載
- Published in NORTH, the newsletter of the Kita-Osaka Chamber of Commerce and Industry
  - 北大阪商工会議所会報誌、NORTH掲載

UNISOKU 2024 Posted to X



UNISOKU 50th Anniversary What's new?

Company Trip to Kumamoto and Oita

熊本・大分社員旅行

In commemoration of our 50th anniversary, we held a company trip to Kumamoto and Oita, which was attended by 52 people including employees and their families.
We will continue to strive to provide better products to all of our customers, and the entire company will work together as one.

50周年を記念して熊本・大分への社員旅行を実施し、社員と家族あわせて52名が参加しました。
今後も皆様により良い製品を提供できるよう努め、全社一丸となって精進してまいります。

Unisoku original reusable bag

We have produced reusable bag to commemorate our 50th anniversary. We will distribute the bags at conferences and other events, and look forward to seeing you at our booth or our head office.

50周年を記念してエコバッグを製作しました。学会などで配布いたしますのでブースへのご訪問、ご来社お待ちしております。

50th Anniversary logo

The story of 50th Anniversary logo **50周年記念ロゴ製作経緯**

The design combines the diffraction grating of a spectroscopic product with the scanning probe microscope with "50".
分光製品の回折格子と走査プローブ顕微鏡をシンボル化したものに「50」を融合させたデザインにしました。

New Uniform

As UNISOKU enters its 51st year, the employee uniforms have been renewed. The new design is highly functional and suits the modern era. The design and color were decided based on a survey conducted among employees.

ユニソクで働く社員のユニフォームも５１年目を迎えるにあたり新しくなりました。大変機能的で今の時代にあったデザインになっています。社員へのアンケートを行い、デザイン・色が決まりました。

X始めました！ Come to visit us on our account! X

@UNISOKU_PR

In addition to paper introductions, conference exhibitions, and conference presentation information, you will now be able to view the latest updates on UNISOKU in real-time.

論文紹介や学会展示、学会発表情報に加え、ユニソクの近況をこれからはリアルタイムで随時ご覧いただけます。

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。
また装置をなかなか購入できない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

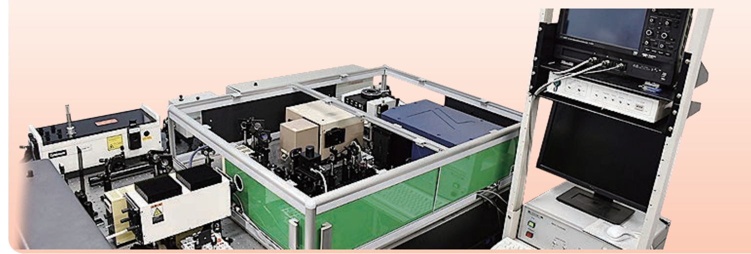
CoolSpeK ※

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 custom 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

※こちらはデモ測定のみの対応です。

Now Accepting Demo Measurements

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!

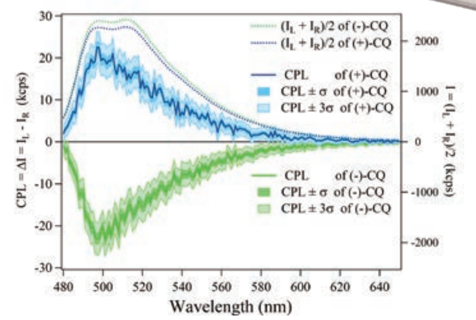
Brand-New Product Introduction 新製品情報

Reasonably Priced Circularly Polarized Luminescence Spectrophotometer
リーズナブルなCPL分光計

New

- Table-Top CPL System
- Optical Layout of 180°- Excitation
- Excitation by Xe-lamp and bandpass filters
- Gate-Switching-Photon-counting Synchronized with PEM

- テーブルトップサイズのCPLシステム
- 180° 光学配置
- Xeランプとバンドパスフィルターによる光励起
- PEMに同期させた2 ch.フォトンカウンティング



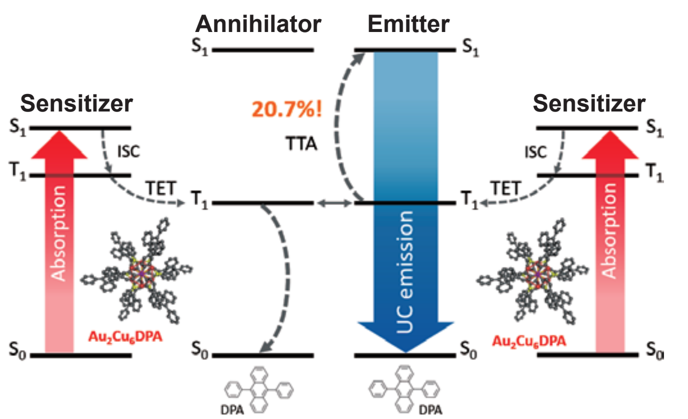
Example / Camphorquinone in ethanol
Exc. Wavelength: 375±25 nm

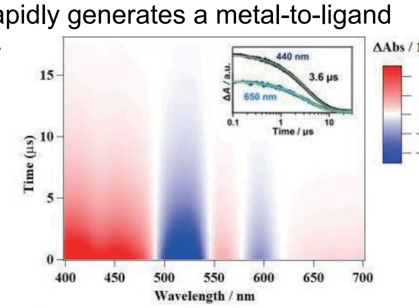
Triplet-Mediator Ligand-Protected Metal Nanocluster Sensitizers for Photon Upconversion

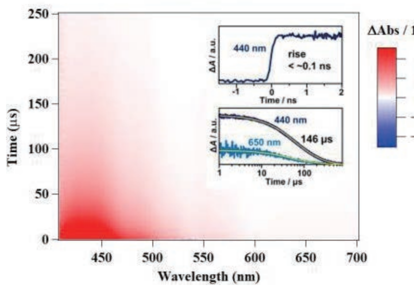
D. Arima *et al.* JACS **146**, 16630 (2024).

Publication Introduction 論文紹介

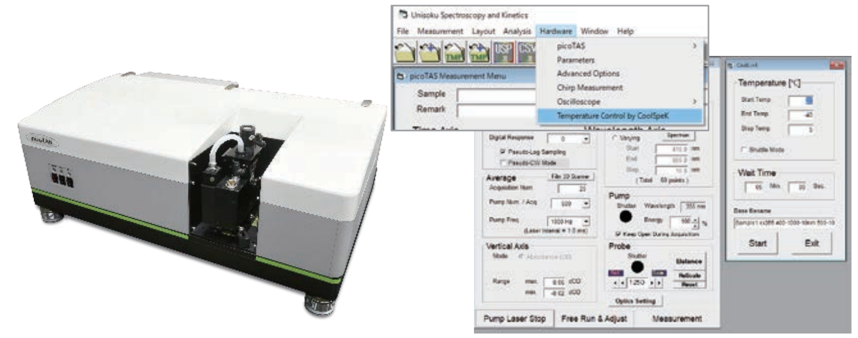

Recently, triplet−triplet annihilation photon upconversion (TTA-UC), a conversion of red light (lower-energy) to blue light (higher energy), has attracted a great deal of attention and is being actively investigated as a viable approach to exploit unutilized wavelengths of light in solar-driven devices. Prof. Mitsui's laboratory at Rikkyo University has focused on the use of atomically precise metal nanoclusters (NCs) as a promising platform for providing sensitizers for TTA-UC. In 2024, they achieved a red-to-blue upconversion quantum yield of 20.7 ± 0.4% (50% is the theoretical maximum) at a low light intensity comparable to solar-energy, setting a new record.They developed a triplet-mediator ligand (TL)-protected metal nanocluster, $Au_2Cu_6(S\text{-}Adm)_6[P(DPA)_3]_2$($Au_2Cu_6$DPA), to improve the TTA-UC efficiency. Using picoTAS and thorough analysis of transient absorption data, they confirmed that the excitation of the Au_2Cu_6 core rapidly generates a metal-to-ligand charge transfer state, followed by the formation of long-lived triplet state (approximately 150 μs) at a DPA site in the TL. In a mixed solution of Au_2Cu_6DPA as a sensitizer and a DPA molecule as an annihilator/emitter, intense blue-light emission under red-light illumination, that is, highly efficient TTA-UC was clearly observed. Given the extensive repertoire of metal NCs that can be protected by various ligands, this study is considered a pioneering step toward the future progress in the development of TTA-UC, especially from near-infrared light to visible light.







picoTAS Updates picoTASの最新情報



Added Linkage function to CoolLinK
UNISOKU measurement system completely links to CoolLinK, so you can measure transient absorption spectrum with temperature variation automatically.
This function can save your time for measuring.

picoTASにCoolSpeKとの連携機能を追加
CoolLinK の U-Link Mode を使い、試料の温度制御と過渡吸収測定の連携を自動で行います。

2-D Scanner Renewed
2-D Scanner for thin-film has been redesigned. Load capacity and stability of movements has been greatly improved.

2-D スキャナーを刷新
薄膜等試料用のXYスキャナーを再設計。
耐荷重と安定性が大幅に向上。

CoolSpeK Updates CoolSpeKの最新情報

CoolLinK Automatic Temperature Variable Software 自動温度可変ソフトウェア

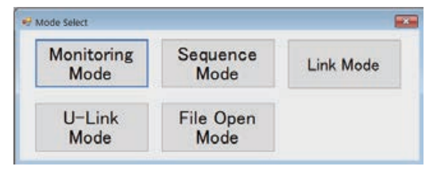
Features 製品特徴

- Easy to design temperature profile with PC
- Monitorable actual temperature in real time
- Linkable with various commercial spectroscopy

- 容易に温度プロファイルのデザインが可能
- 実際の温度をリアルタイムで監視可能
- 各社の分光光度計との連携が可能

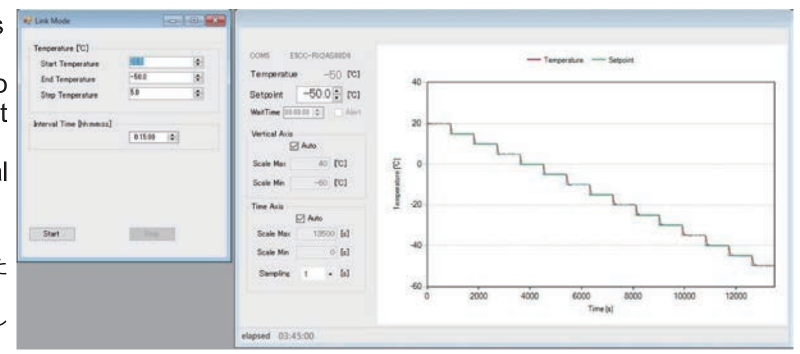
CoolLinK has four temperature control mode.
We will show you one of them in this article.

測定に合わせて4つの制御モードを選択できます。
今回はこの中から "Link Mode" についてご紹介します。



You can make simple temperature profile that has constant temperature variation and time interval. UNISOKU measurement system completely links to Link Mode, so you can measure temperature dependent spectrum automatically.
Link Mode can also be used with various commercial spectrometers that has a repeat-scan function. (Pseudo-cooperative measurement)

Sequence Modeよりも簡易な設定で、温度を段階的に変更したコントロールが可能。
ユニソク製計測機器との連携の他に、他社分光光度計の繰り返し測定機能を利用した「擬似連携測定」が可能。
温度プロファイルは保存して再利用可能。

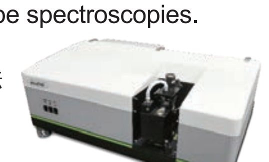


CoolSpeK SLIM USP-203C-ST-BP

For picoTAS or pump-probe spectroscopies

Cryostat for 2 mm light-path cuvette. It is suitable for picoTAS or pump-probe spectroscopies.
光路長2mmの光学セル専用。
picoTASやポンププローブ法での過渡吸収測定に最適。

Equipped with a stirrer
スターラー内蔵



Under Development

クールスペック新モデル開発中

We are developing a new cryostat that has higher airtightness for vacuum pumping and can be used at lower temperature than the present model.

本体内部を真空引きすることにより現行品の推奨温度より低い温度で低結露測定を実現できる、高密閉型モデルを開発中です。

New Technology in the USM Series

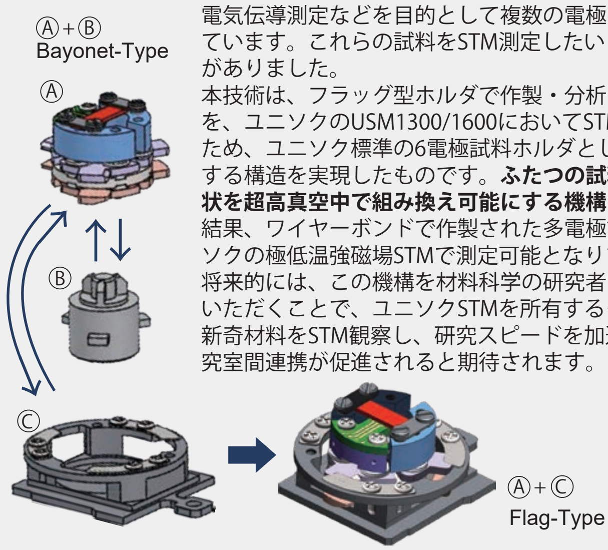
USMシリーズにおける新技術紹介

Six-Electrode Sample Holder Functioning as Both Flag-Type and Bayonet-Type “Aquila”

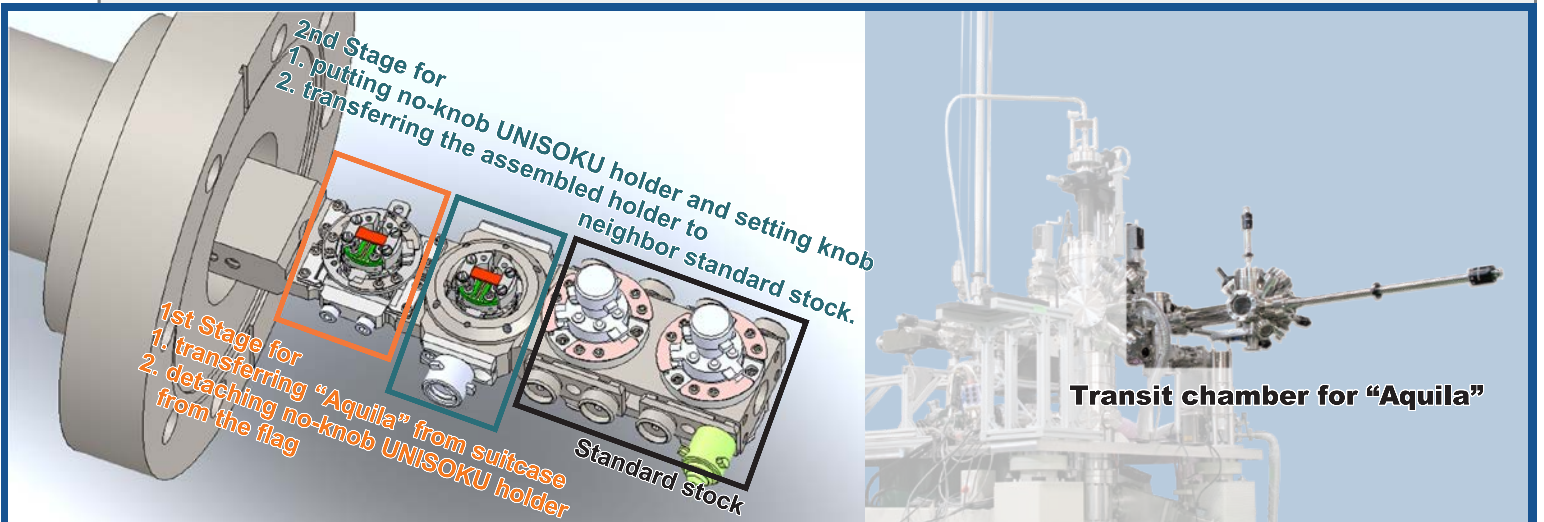
フラッグ型とバヨネット型として機能する6電極試料ホルダ “アクイラ”

Overview / 概要

In materials science research, flag-type sample holders are commonly used in sample preparation and analysis equipment, and they typically include multiple electrodes for purposes such as electrical conductivity measurements. There was a request to perform STM measurements on these samples. **This structure enables the STM measurement of samples prepared and analyzed with a flag-type holder using the UNISOKU USM1300/1600.** This holder also functions as a UNISOKU standard 6-electrode sample holder. By introducing the mechanism that allows the interchangeable use of the two sample-holder shapes in ultra-high vacuum, multi-electrode samples made with wire bonding can now be measured using the UNISOKU low-temperature high-field STM.
In the future, we expect that the adoption of this mechanism by materials science researchers will promote inter-laboratory collaboration, accelerating the research speed as groups owning UNISOKU STM systems observe novel materials and advance their studies.



材料科学研究で使用される試料作製・分析装置では、フラッグ型試料ホルダが主流となっており、一般的に電気伝導測定などを目的として複数の電極が備えられています。これらの試料をSTM測定したいという要望がありました。
本技術は、フラッグ型ホルダで作製・分析された試料を、ユニソクのUSM1300/1600においてSTM測定するため、ユニソク標準の6電極試料ホルダとしても機能する構造を実現したものです。**ふたつの試料ホルダ形状を超高真空中で組み換え可能にする機構を導入**した結果、ワイヤーボンドで作製された多電極試料もユニソクの極低温強磁場STMで測定可能となりました。
将来的には、この機構を材料科学の研究者に採用していただくことで、ユニソクSTMを所有するグループが新奇材料をSTM観察し、研究スピードを加速させる研究室間連携が促進されると期待されます。



Interview with Designer 設計者インタビュー

Interviewer：S. Yamamoto

The time spent on the design alone exceeded 200 hours!

This was twice as long as the design time for the entire standard STM system (100 hours), making it an extremely difficult task. Initially, I thought it would be simple—just removing the knob of the UNISOKU sample holder—but it turned out to be incredibly challenging to meet all the convenience requirements while making it **compatible with the standard USM system.** In fact, there was a period when I even considered giving up on the design. This was a situation I had never encountered as a designer.

ホルダ設計に要した時間だけで200時間超！


Design Dep. 設計課
Sasada 笹田

これは標準的なSTMシステム全体の設計時間(100時間)の2倍かかったほど難産でした！当初、ユニソク試料ホルダのつまみを外すだけでよいと楽観的に捉えていましたが、利便性のための要求を全て満たしつつ**標準USMシステムで利用可能**にすることが非常に難しく、設計者としてこんなこと初めてですが、実は、設計することを諦めた時期もありました(笑)。

It was truly a challenging design, but I believe that the numerous discussions I had with Dr. Yamamoto from the Sales Engineering Department were key to bringing the design to a satisfying conclusion. Moving forward, I am convinced that continuing cross-departmental discussions will greatly benefit not only the design itself but also the UNISOKU organization.

本当に大変な設計でしたが、営業技術部の山本と何度も設計の議論をしたことが、納得いく形に仕上がった要因と考えています。今後も、設計自体のためだけでなく組織のためにもなると信じて、垣根を越えた議論を続けていくつもりです。

Probe Approach Technique for a Sample Unable to Observe Optically

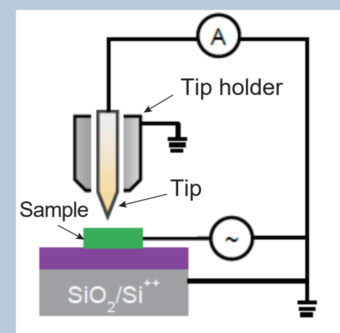
光学観察できない試料への探針アプローチ技術

概要/ Overview

In recent research on two-dimensional materials, device structures with electrodes patterned to a few µm in width are used for samples on the order of tens of µm in size. There has been a demand to observe these small samples using ultra-low temperature/high magnetic field STM.
This development provides a technique to approach an STM tip on a small sample in situations where the sample is not directly visible. By integrating and controlling the tip-sample capacitance measurements and XY coarse-motion driving with position sensors, it became possible to image a wide area of 2 mm with a spatial resolution of < 5 µm and precisely approach the tip on the target sample.
This technology can be integrated with UNISOKU's standard STM controller "Nanonis," enabling wide-area imaging in the same way as STM imaging. Furthermore, since this technique is not limited to STM and can be applied to any system using conductive tips, it holds great potential for expanding future applications.

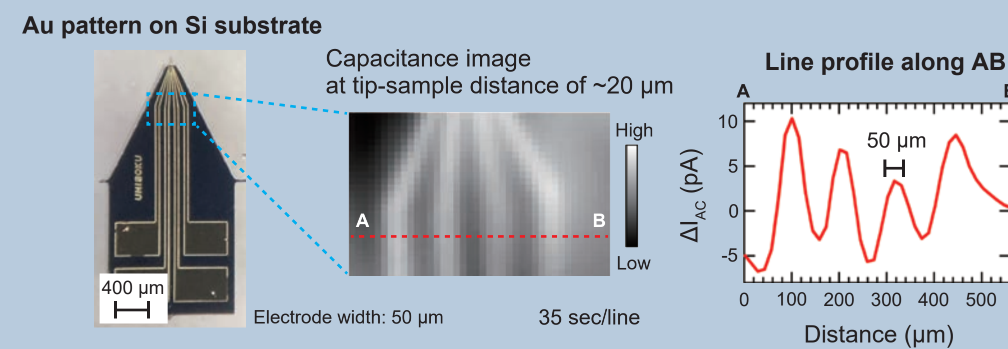
近年の二次元材料研究では、数十μmのサイズの試料に数μm幅の電極を複雑にパターニングしたデバイス構造が使用されています。
このような微小試料を極低温/強磁場STMで観察したいという要望がありました。
本開発は、試料が直接見えない状態でSTM探針を微小試料にアプローチさせる技術です。探針と試料の容量計測および位置センサーを用いたXY粗動制御を統合することにより、**2mmの広域領域を<5μmの空間分解能で画像化し、正確に試料に探針をアプローチさせることが可能**となりました。
この技術は、ユニソクSTMの標準コントローラ「Nanonis」に統合することができSTM画像化と同様の感覚で広域画像化が可能です。また、STMに限定されず伝導性探針を接近させる装置には同様の画像化技術を応用できるため、将来的には応用範囲が拡大すると期待されます。

Tip Holder for Capacitance Imaging



Y. Que *et al.*,
Nanotechnology **34**, 455704 (2023).

Capacitance Imaging Performance Test



Interview with Electrical Engineering Department 制御課インタビュー

Interviewer：S. Yamamoto

Development began in response to a customer request to land an STM tip on a sample just a few µm in size inside USM1300/1600, where there is no way to see samples. The breakthrough came when we learned about research reporting that surface structure could be obtained via capacitance measurements, even **with the tip positioned tens of µm away from the sample.** This led us to believe that wide-area imaging via capacitance measurement could enable precise STM tip landing on µm-scale samples.

試料が直接見えないUSM1300 /1600で数μmの試料にSTM針を着地させたい、という顧客の要望から開発を始めました。突破口となったのは**針を数十μm離しても容量計測なら表面情報を取得できる**という研究結果をいただいたことで、この容量計測による広域画像化により、数μmの試料への着地が実現できるかもと考えました。

The most challenging part was **the integration with Nanonis.** To incorporate our control system into the imaging process of Nanonis, which is not our own product, we had to go through repeated trial and error in the circuit design for interaction. Additionally, with the need to meet CE certification requirements, the development schedule was very tight, which made it quite tough. When we finally succeeded in obtaining wide-area images, it was a huge relief.



一番気を使ったのは、**Nanonisとの統合**です。他社製品であるNanonisにおける画像化プロセスに、ユニソクの制御装置を組み込むため相互作用させる回路設計には何度も試行錯誤しました。
また、CE認証対応もあり厳しい開発日程で大変でしたが、実際に広域画像が見えたときはほっとしました。

Photo:Electrical Engineering Dep. members
写真：制御課メンバー

装置を購入せず、STM実験データを取得しませんか？
Why not obtain STM data without purchasing the STM system?

目的　Objective

極低温SPMの計測環境を有償で提供する、**"レンタルラボ"** サービスが利用受付中です。ハイエンドSPMのマシンタイムを購入可能にし、論文に最適な測定データをより多くの方に提供するため、本サービスを始めました。

Our **'Rental Lab'** service, offering a specialized environment for low Temperature SPM measurements, is now available. This service was launched to make high-end experimental data acquisition more accessible to researchers by providing machine time on cutting-edge SPM equipment, helping you achieve optimal results for your publications.

サービス内容　Service Description

来社実験、リモート実験、ユニソクスタッフによる代理測定が可能となっています。装置購入だけでなく、装置メンテナンスの労力・時間が必要なくなり、実験計測への投資効率を高めることが可能です。

Our service offers on-site experiments, remote experiment, and experiments conducted by UNISOKU staff on your behalf. In addition to eliminating the need to purchase equipment, this service removes the burden of equipment maintenance, saving time and effort while significantly improving the efficiency of your investment in SPM measurements.

Special discount available for first-time users　初回利用時に特別割引中

利用受け入れ装置　Available Systems

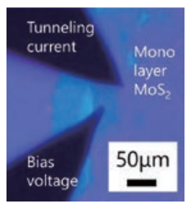
UHV Time-Resolved Multi-Probe Microscope
超高真空時間分解マルチプローブ顕微鏡

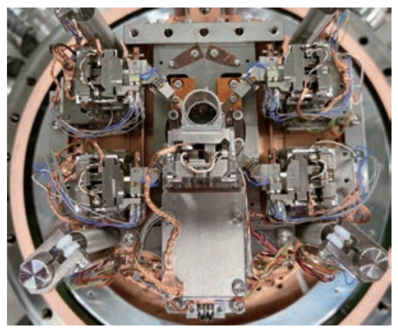
Carrier dynamics measurement of micro samples on insulating substrate

絶縁基板上の微小サンプルのキャリアダイナミクスを測定可能

Demo measurement conditions
- Temperature: 77 K or 300 K
- Pressure: ~10^{-8} Pa
- Laser wavelength: 488, 532 nm
- Temporal resolution: ~80 ps (532 nm), ~10 ns (488 nm)

デモ実験条件
温度: 77 K 又は 300 K
真空度: ~10^{-8} Pa
レーザー波長: 488, 532 nm
時間分解能: ~80 ps (532 nm), ~10 ns (488 nm)

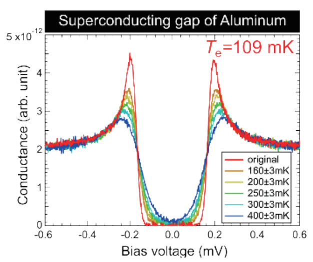




40 mK UHV STM 1.75 T-1.75 T-7 T vector magnet
40 mK 超高真空強磁場STM

USM1600
Specifications
- $T_{STM\ Head}$ = 40 mK
- Vector Magnet operation
- RF cables up to 40 GHz
- Long-term d*I*/d*V* measurement
- Position sensor with 1 μm precision

装置仕様
40 mK以下
ベクターマグネット操作
40GHz までの高周波ケーブル
長時間d*I*/d*V* 測定
1 um精度の位置センサー



1.5 K UHV SPM with optical access
1.5 K超高真空光学アクセスSPM

USM1200 JT
Specifications
- $T_{STM\ Head}$ = 1.5 K (when optical shutters close)
- Compatible with AFM measurement
- Optical access capabilities by inertial-driven lens stages
- Time resolved STM with high spatial resolution
- Shot noise measurement by integrated RydeenAmp

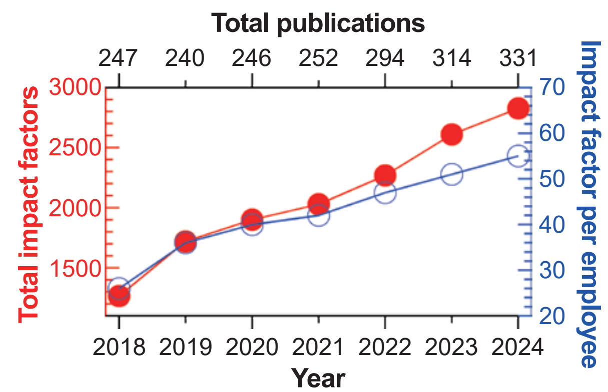
装置仕様
試料温度1.5 K以下（光学アクセス閉鎖時）
AFM対応　内部レンズ付き光学アクセス
高空間分解能時間分解STM
Rydeen Amp (内蔵高周波アンプ)によるショットノイズ測定

来社実験詳細についてはお気軽にご相談ください！
Feel free to contact us about the details! ▶ ▶ ▶ info@unisoku.co.jp

Introduction of Publications
論文の紹介

Publication Stats in 2024

- Total number of publications using UNISOKU systems = 331 (314 in 2023)
- Total impact factors ~2827 (2610 in 2023)
  Corresponding to 56 Nature papers (40 in 2023)
  c.f. Impact factor of Nature ~50 (64 in 2023)
- Impact factor per employee ~ 55 (~51 in 2023)



Popular Research Fields	Num. of Publications	Average Impact Factor
Transition Metal Dichalcogenides (TMDs)	39	12.6
Molecules (TERS)	36	11.1
Low Dimensional Materials excluding TMDs, graphene, 2D superconductivity	25	10.6
Kagome Materials	24	16.7
Topological Materials (Majorana, Weyl)	22	16.3
Superconductivity (heavy fermion, PDW)	18	7.2
Graphene	16	12.7
Fe-based Superconductors	12	15.6
picoTAS	12	12.7
Single Atom Spin (ESR-STM)	9	12.6

Publication List in 2024

Nature

1. **A Hybrid Topological Quantum State in an Elemental Solid**
   M. Hossain *et al*., Nature **628**, 527 (2024). *USM1300*
2. **All-Optical Subcycle Microscopy on Atomic Length Scales**
   T. Siday *et al*., Nature **629**, 329 (2024). *USM1400*
3. **Optical Manipulation of the Charge-Density-Wave State in RbV_3Sb_5**
   Y. Xing *et al*., Nature **631**, 60 (2024). *USM1200*
4. **Phonon Modes and Electron-Phonon Coupling at The $FeSe/SrTiO_3$ Interface**
   H. Yang *et al*., Nature **635**, 332 (2024). *USM1300*

Science

Mapping Twist-Tuned Multiband Topology in Bilayer WSe_2
B. Foutty *et al*., Science **384**, 343 (2024). *USM1300*

Nature Nanotechnology

Submolecular-Scale Control of Phototautomerization
A. Roslawska *et al*., Nat. Nanotechnol. **19**, 738 (2024). *USM1400*

Nature Materials

Van-Hove Annihilation and Nematic Instability on a Kagome Lattice
Y. Jiang *et al*., Nat. Mater. **23**, 1214 (2024). *USM1300*

Advanced Materials -1

1. **Coexistence of Quantum-Spin-Hall and Quantum-Hall-Topological-Insulating States in Graphene/hBN on $SrTiO_3$ Substrate**
   R. Obata *et al*., Adv. Mater. **36**, 2311339 (2024).
2. **Realization of Two-Dimensional Intrinsic Polar Metal in a Buckled Honeycomb Binary Lattice**
   X. Zhang *et al*., Adv. Mater. **36**, 2404341 (2024). *UNISOKU Controller*
3. **Direct Observations of Spontaneous In-Plane Electronic Polarization in 2D Te Films**
   Z. Zhang *et al*., Adv. Mater. **36**, 2405590 (2024). *USM1300*

Publication List in 2024

Advanced Energy Materials

How to Interpret Transient Absorption Data?: An Overview of Case Studies for Application to Organic Solar Cells
Y. Tamai *et al.*, Adv. Energy Mater. **14**, 2301890 (2024). *picoTAS*

Nature Chemistry

Trapping of a Phenoxyl Radical at a Non-Haem High-Spin Iron(II) Centre
D. Kass *et al.*, Nat. Chem. **16**, 658 (2024). *CoolSpeK*

Nature Physics

1. **Quantum Transport Response of Topological Hinge Modes**
M. Hossain *et al.*, Nat. Phys. **20**, 776 (2024). *PtIr*
2. **Melting of the Charge Density Wave by Generation of Pairs of Topological Defects in UTe_2**
A. Aishwarya *et al.*, Nat. Phys. **20**, 964 (2024). *USM1300*
3. **Spin Berry Curvature-Enhanced Orbital Zeeman Effect in a Kagome Metal**
H. Li *et al.*, Nat. Phys. **20**, 1103 (2024). *USM1300*
4. **Highly Anisotropic Superconducting Gap Near the Nematic Quantum Critical Point of $FeSe_{1-x}S_x$**
P. Nag *et al.*, Nat. Phys. DOI: 10.1038/s41567-024-02683-x *USM1300*

Chem

Single-Molecule Spectroscopic Probing of N-heterocyclic Carbenes on a Two-Dimensional Metal
L. Li *et al.*, Chem DOI: 10.1016/j.chempr.2024.08.013 *USM1400TERS*

Advanced Functional Materials

1. **Broad-Wavelength Light-Fuelled Organic Crystal Oscillators Driven by Multimodal Photothermally Resonated Natural Vibration**
S. Hasebe *et al.*, Adv. Func. Mater. **34**, 2410671 (2024). *USP-PSMM-NP*
2. **Chemical Vapor Deposition Growth of Atomically Thin $SnSb_2Te_4$ Single Crystals Toward Fast Photodetection**
Y. Li *et al.*, Adv. Func. Mater. **34**, 2316849 (2024). *USM1500*

ACS Nano -1

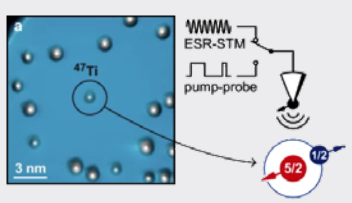
1. **Atomistic Probing of Defect-Engineered 2H-$MoTe_2$ Monolayers**
O. Okello *et al.*, ACS Nano **18**, 6927 (2024).
2. **Imaging Valley Excitons in a 2D Semiconductor with Scanning Tunneling Microscope-Induced Luminescence**
H. Geng *et al.*, ACS Nano **18**, 8961 (2024). *USM1400*

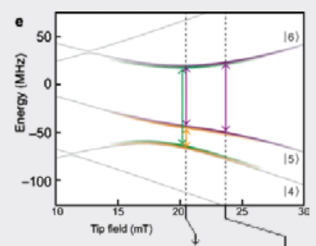
Coherent Spin Dynamics Between Electron and Nucleus Within a Single Atom

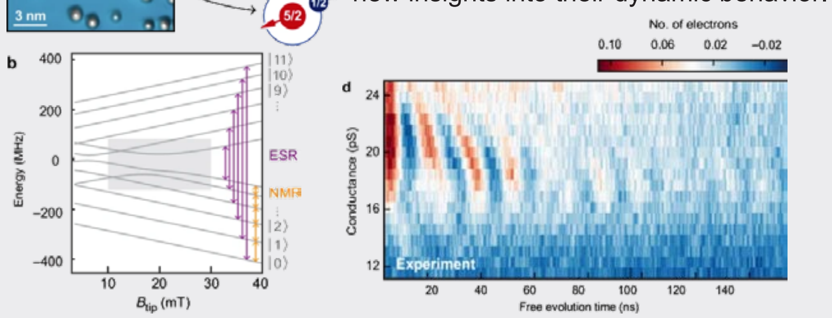
Veldman *et al.*, Nat. Commun., **15**, 7951 (2024).

Product used: USM1300

Nuclear spins offer stable quantum information with long coherence time but present challenges in studying their time evolution in detail. Using ESR-STM, Veldman *et al.*, (Sander Otte group, Delft University of Technology) elucidated the time-resolved dynamics of nuclear spin of a single ^{47}Ti isotope. By incorporating probe magnetic field control into standard ESR-STM measurements, they achieved tunable hybridization of nuclear spin states. Furthermore, employing a voltage pump-probe technique enabled the observation of nuclear spin time evolution, providing new insights into their dynamic behavior.







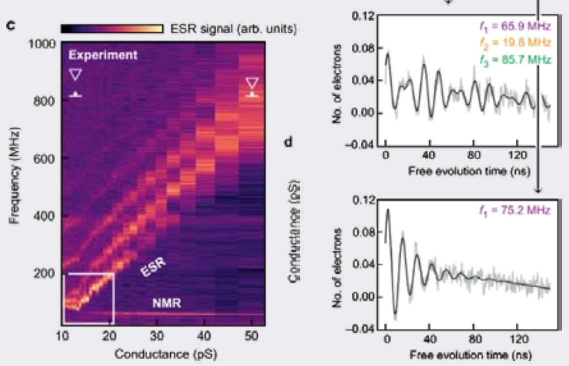


Figure (a) STM topography of the single ^{47}Ti and a schematic drawing of the ESR-STM setup. (b) Energy diagram of the atomic eigenstates as a function of the tip magnetic field. (c) ESR-STM measurements as function of tip-sample conductance, which corresponds to the tip magnetic field. (d) Pump-probe data for different tip-atom distances, revealing various coherent electron-nuclear flip-flop oscillations. (e) Zoom-in on the relevant avoided level crossing of (b). A line trace from the pump-probe data in (d) at the corresponding tip fields is fitted with multiple frequencies.

ACS Nano -2

3. **All-Electrical Driving and Probing of Dressed States in a Single Spin**
H. Bui *et al.*, ACS Nano **18**, 12187 (2024). *USM1300*
4. **Van Hove Singularity and Enhanced Superconductivity in Ca-Intercalated Bilayer Graphene Induced by Confinement Epitaxy**
S. Ichinokura *et al.*, ACS Nano **18**, 13738 (2024). *USM1400-4P*
5. **Wafer-Scale Synthesis of Highly Oriented 2D Topological Semimetal $PtTe_2$ via Tellurization**
M. Choi *et al.*, ACS Nano **18**, 15154 (2024). *USM1200*
6. **van der Waals Engineering of Charge Density Waves in One-Dimensional Nb_6Te_6 Nanowires**
X. Lin *et al.*, ACS Nano **18**, 13241 (2024). *USM1400*
7. **Dual Dirac Nodal Line in Nearly Freestanding Electronic Structure of β-Sn Monolayer**
Y. Lan *et al.*, ACS Nano **18**, 20990 (2024).
8. **Quantum States Induced by Strong Interface Coupling in a 2D VSe_2/Bi_2Se_3 Heterostructure**
X. Wang *et al.*, ACS Nano **18**, 24812 (2024). *USM1300*
9. **Tilted Spins in Chains of Molecular Switches on Pb(100)**
M. Treichel *et al.*, ACS Nano **18**, 26184 (2024). *USM1300*
10. **Tunable Out-of-Plane Reconstructions in Moiré Superlattices of Transition Metal Dichalcogenide Heterobilayers**
H. Zhao *et al.*, ACS Nano **18**, 27479 (2024). *USM1400*
11. **On-Surface Atomic Scale Qubit Platform**
C. Wolf *et al.*, ACS Nano **18**, 28469 (2024). *USM1300*
12. **Chemically Interrogating N-Heterocyclic Carbenes at The Single-Molecule Level Using Tip-Enhanced Raman Spectroscopy**
L. Li *et al.*, ACS Nano **18**, 32118 (2024). *USM1400*
13. **Atomically Sharp 1D Interfaces in 2D Lateral Heterostructures of VSe_2-$NbSe_2$ Monolayers**
X. Wang *et al.*, ACS Nano **18**, 31300 (2024). *USM1300*
14. **Tunable Quantum Confinement in Individual Nanoscale Quantum Dots via Interfacial Engineering**
H. Ren *et al.*, ACS Nano DOI: 10.1021/acsnano.4c13885 *USM1500*
15. **Correlation-Induced Symmetry-Broken States in Large-Angle Twisted Bilayer Graphene on MoS_2**
K. Li *et al.*, ACS Nano **18**, 7937 (2024). *USM1300*

Nature Communications-1

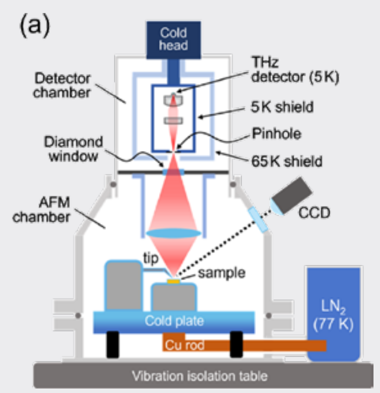
1. **Dual Higgs Modes Entangled Into a Soliton Lattice in CuTe**
S. Kwon *et al.*, Nat. Commun. **15**, 984 (2024).
2. **Charge-Density Wave Mediated Quasi-One-Dimensional Kondo Lattice in Stripe-Phase Monolayer 1T-$NbSe_2$**
Z. Liu *et al.*, Nat. Commun. **15**, 1039 (2024). *USM1500*
3. **Phonon Promoted Charge Density Wave in Topological Kagome Metal ScV_6Sn_6**
Y. Hu *et al.*, Nat. Commun. **15**, 1658 (2024). *USM1500*
4. **Direct Visualization of Stacking-Selective Self-Intercalation in Epitaxial $Nb_{1+x}Se_2$ Films**
H. Wang *et al.*, Nat. Commun. **15**, 2541 (2024). *RT-STM*
5. **Visualizing a Single Wavefront Dislocation Induced by Orbital Angular Momentum in Graphene**
Y. Liu *et al.*, Nat. Commun. **15**, 3546 (2024). *USM1300, 1400, 1500*
6. **Inhomogeneous High Temperature Melting and Decoupling of Charge Density Waves in Spin-Triplet Superconductor UTe_2**
A. LaFleur *et al.*, Nat. Commun. **15**, 4456 (2024). *USM1300*

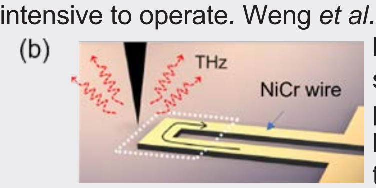
Nanoscale Thermal Imaging of Hot Electrons by Cryogenic Terahertz Scanning Noise Microscopy

Weng *et al.*, Rev. Sci. Instrum. **95**, 063705 (2024).

Product used: Cryo-SNoiM

Terahertz Scanning Noise Microscopy (SNoiM) is a unique technique enabling the observation of electron temperatures with nanoscale spatial resolution. However, earlier SNoiM systems were primarily optimized for room-temperature measurements and were time-intensive to operate. Weng *et al.* (Yousoo Kim group, RIKEN) addressed these limitations by developing a dual-chamber cooling system. In this system, the terahertz detector is cooled to ~5 K using a pulse tube cryocooler, while a separate chamber houses the sample and AFM tip, which can be maintained at either room temperature or ~110 K. This design allows for the pre-selection of tips at room temperature and enables precise determination of local electron temperatures without requiring adjustable parameters.
This innovative approach opens new possibilities for studying low-temperature hot electron dynamics and nonequilibrium transport in various materials.





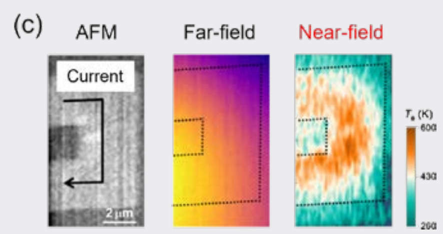


Figure (a) Schematic diagram of Cryo-SNoiM. (b) Diagram of hot electron imaging of NiCr wire. (c) Simultaneously obtained 2D images of the NiCr wire: topography, far-field and near-field (SNoiM) signals.

Publication List in 2024

Nature Communications-2

7. Large-Scale 2D Heterostructures From Hydrogen-Bonded Organic Frameworks and Graphene With Distinct Dirac and Flat Bands
X. Zhang *et al.,* Nat. Commun. **15**, 5934 (2024). *USM1300*

8. Electrochemical On-Surface Synthesis of a Strong Electron-Donating Graphene Nanoribbon Catalyst
H. Sakaguchi *et al.,* Nat. Commun. **15**, 5972 (2024). *USM1100*

9. Quantifying the Conductivity of a Single Polyene Chain by Lifting with an STM Tip
S. You *et al.*, Nat. Commun. **15**, 6475 (2024). *USM1500*

10. Atomic-Precision Control of Plasmon-Induced Single-Molecule Switching in a Metal–Semiconductor Nanojunction
Y. Park *et al.*, Nat. Commun. **15**, 6709 (2024). *USM1400*

11. Coherent Spin Dynamics Between Electron and Nucleus Within a Single Atom
L. Veldman *et al.*, Nat. Commun. **15**, 7951 (2024). *USM1300*

12. Robust Flat Bands in Twisted Trilayer Graphene Moiré Quasicrystals
C. Hao *et al.,* Nat. Commun. **15**, 8437 (2024). *USM1400*

13. Artificial Superconducting Kondo Lattice in a Van Der Waals Heterostructure
K. Fan *et al.*, Nat. Commun. **15**, 8797 (2024). *USM1300*

14. Relativistic Artificial Molecule of Two Coupled Graphene Quantum Dots at Tunable Distances
X. Zhou *et al.,* Nat. Commun. **15**, 8786 (2024). *USM1500*

15. Hierarchical Zero- And One-Dimensional Topological States in Symmetry-Controllable Grain Boundary
W. Jang *et al.*, Nat. Commun. **15**, 9328 (2024). *USM1300*

16. Fluorescence From a Single-Molecule Probe Directly Attached to a Plasmonic STM Tip
N. Friedrich *et al.*, Nat. Commun. **15**, 9733 (2024). *USM1400*

17. Orientation-Selective Spin-Polarized Edge States in Monolayer NiI_2
Y. Wang *et al.*, Nat. Commun. **15**, 10916 (2024). *USM1300*

18. Highly Efficient Multi-Resonance Thermally Activated Delayed Fluorescence Material Toward a BT.2020 Deep-Blue emitter
J. Ochi *et al.,* Nat. Commun. **15**, 2361 (2024). *CoolSpeK*

Angewandte Chemie International Edition -1

1. Photocatalytic CO_2 Reduction Using an Osmium Complex as a Panchromatic Self-Photosensitized Catalyst: Utilization of Blue, Green, and Red Light
K. Kamada *et al.*, Angew. Chem. Int. ed. **63**, e202403886 (2024). *picoTAS*

2. Multiphoton-driven Photocatalytic Defluorination of Persistent Perfluoroalkyl Substances and Polymers by Visible Light
Y. Arima *et al.*, Angew. Chem. Int. ed. **136**, e202408687 (2024). *picoTAS*

3. Aza-Diarylethenes Undergoing Both Photochemically and Thermally Reversible Electrocyclic Reactions
S. Hamatani *et al.*, Angew. Chem. Int. ed. **63**, e202414121 (2024). *CoolSpeK*

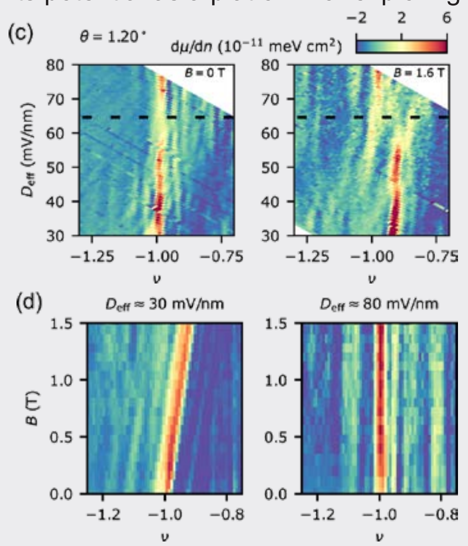
4. The Effect of Torsional Motion on Multiexciton Formation through Intramolecular Singlet Fission in Ferrocene-Bridged Pentacene Dimers
R. Hayasaka *et al.*, Angew. Chem. Int. ed. **63**, e202315747 (2024). *picoTAS, CoolSpeK*

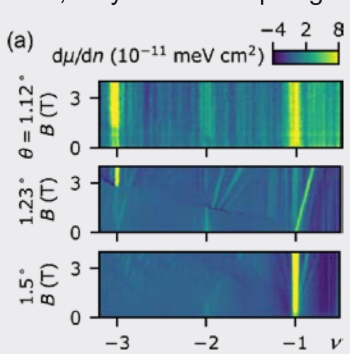
Mapping Twist-tuned Multiband Topology in Bilayer WSe_2

Foutty *et al.*, Science **384**, 343 (2024).

Product used: USM1300-SET

This study investigates twisted bilayer WSe_2 at small twist angles, focusing on its potential as a platform for exploring interaction-driven topological phases. Using scanning single-electron transistor (SET) microscopy, Foutty *et al.* (Feldman group, Stanford Univ.) conduct local electronic compressibility dμ/dn measurements and identify a "magic angle" near 1.23° where multiple topological bands emerge, hosting a series of Chern insulators even at zero magnetic fields. By applying a displacement field, they induce a topological quantum phase transition, demonstrating the tunability of these phases. These findings open pathways for studying exotic phases such as fractional Chern insulators and quantum spin Hall states in highly tunable moiré systems.





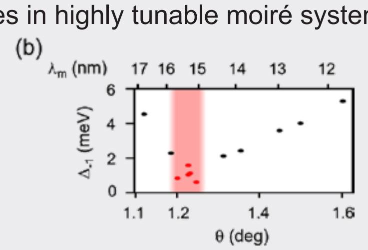


Figure (a) dμ/dn as a function of ν and B at a selection of twist angles. (b) Thermodynamic gap at B = 0 T for ν =-1 as a function of twist angles. (c) dμ/dn as a function of D_{eff} and ν at B = 0 and 1.6 T (θ= 1.2°). (d) dμ/dn as a function of ν and B around ν =-1 at D_{eff} = 30 and 80 mV/nm.

Angewandte Chemie International Edition -2

5. A Nonlinear Photochromic Reaction Based on Sensitizer-Free Triplet–Triplet Annihilation in a Perylene-Substituted Rhodamine Spirolactam
G. Kawai *et al.*, Angew. Chem. Int. ed. **63**, e202404140 (2024). *picoTAS, TSP-2000, PK120-C-RK*

Journal of the American Chemical Society

1. Altering Spin Distribution of Tb_2Pc_3 Via Molecular Chirality Manipulation
X. Liao *et al.,* J. Am. Chem. Soc. **146**, 5901 (2024). *USM1300*

2. Discovery And Manipulation of Van Der Waals Polarons in Sb_2O_3 Ultrathin Molecular Crystal
Z. Zhang *et al.*, J. Am. Chem. Soc. **146**, 18556 (2024). *USM1500*

3. Vibrational and Magnetic States of Point Defects in Bilayer $MoSe_2$
K. Fan *et al.*, J. Am. Chem. Soc. **146**, 33561 (2024). *USM1300*

4. Artificial Photosynthesis for Regioselective Reduction of $NAD(P)^+$ to NAD(P)H Using Water as an Electron and Proton Source
Y. Hong *et al.*, J. Am. Chem. Soc. **146**, 5152 (2024).

5. Selective Cobalt-Mediated Formation of Hydrogen Peroxide from Water under Mild Conditions via Ligand Redox Non-Innocence
S. Anferov *et al.*, J. Am. Chem. Soc. **146**, 5855 (2024). *CoolSpeK*

6. Axial Ligation Impedes Proton-Coupled Electron-Transfer Reactivity of a Synthetic Compound-I Analogue
J. Thomas *et al.*, J. Am. Chem. Soc. **146**, 12338 (2024).

7. Identification, Characterization, and Electronic Structures of Interconvertible Cobalt–Oxygen TAML Intermediates
D. Malik *et al.*, J. Am. Chem. Soc. **146**, 13817 (2024). *CoolSpeK*

8. Isolating an Inner-Sphere Adduct of $[Ru^{IV}(=O)(terpy)(bpy)]^{2+}$ and $[Ce^{IV}(OH)(NO_3)_5]^{2-}$ with the Oxo Bonded to the Ce^{IV} Center
Y. Aimoto *et al.*, J. Am. Chem. Soc. **146**, 16866 (2024). *CoolSpeK*

9. Cooperative Sulfur Transformations at a Dinickel Site: A Metal Bridging Sulfur Radical and Its H-Atom Abstraction Thermochemistry
V. Tagliavini *et al.*, J. Am. Chem. Soc. **146**, 23158 (2024). *CoolSpeK*

10. Ferrocenyl PNNP Ligands-Controlled Chromium Complex-Catalyzed Photocatalytic Reduction of CO_2 to Formic Acid
T. Wakabayashi *et al.*, J. Am. Chem. Soc. **146**, 25963 (2024). *picoTAS, CoolSpeK*

11. Photo- and Electrocatalytic Hydrogen Evolution by Heteroleptic Dirhodium(II,II) Complexes: Role of the Bridging and Diimine Ligands
P. Gupta *et al.*, J. Am. Chem. Soc. **146**, 27161 (2024). *CoolSpeK*

12. cis-Dihydroxylation by Synthetic Iron(III)–Peroxo Intermediates and Rieske Dioxygenases: Experimental and Theoretical Approaches Reveal the Key O–O Bond Activation Step
P. Wu *et al.*, J. Am. Chem. Soc. **146**, 30231 (2024). *CoolSpeK*

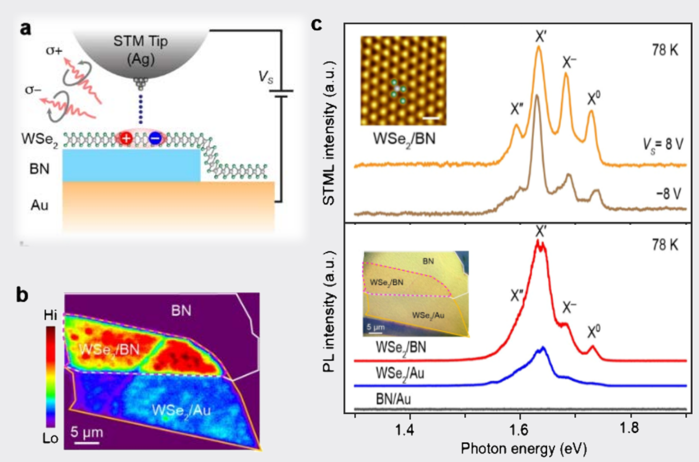
13. Triplet-Mediator Ligand-Protected Metal Nanocluster Sensitizers for Photon Upconversion
D. Arima *et al.*, J. Am. Chem. Soc. **146**, 16630 (2024). *picoTAS*

Imaging Valley Excitons in a 2D Semiconductor with Scanning Tunneling Microscope-Induced Luminescence

Geng *et al.*, ACS Nano **18**, 8961 (2024).

Product used: USM1400

Geng *et al.*, (Rui Zhang group, Anhui University) fabricated monolayer WSe_2 by mechanically transferring it onto gold substrates covered with a 5-10 nm thick hexagonal boron nitride. Voltage dependence of tunnel conductance and electroluminescence intensity using an STM revealed electrical decoupling between WSe_2 and gold, achieving a quantum efficiency two orders of magnitude higher than WSe_2 directly on gold. Luminescence spectroscopy identified distinct exciton states and their fine structures, with spatial variations in individual luminescence intensities observed even within nanoscale-flat regions. These results suggest that sub-nanoscale inhomogeneities influence exciton-related luminescence dynamics. Furthermore, the circularly polarized exciton luminescence indicates the influence from the STM tip. This work provides a promising platform for nanoscale optoelectronic exploration of transition-metal dichalcogenides.



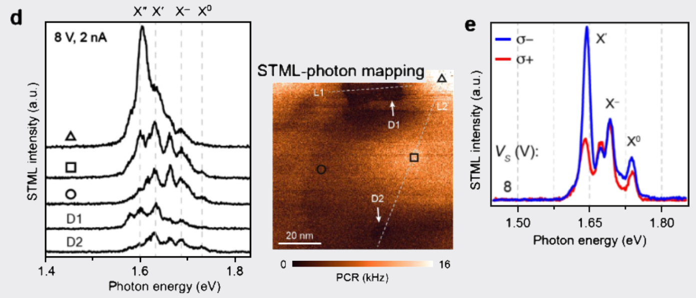


Figure (a) Schematic setup of the STM-induced luminescence (STML) experiment. (b) Photoluminescence (PL) imaging of the WSe_2 on a boron nitride (BN)-covered gold substrate. (c) Comparison of STML and PL spectra measured at multiple regions. Insets show an atomically resolved STM image and an optical micrograph of the sample. (d) STML spectra (left) acquired at five specific locations of the WSe_2/BN/gold sample, as indicated in the STML mapping (right). (e) Circularly polarized STML spectra measured on the WSe_2/BN/gold sample.

Publication List in 2024

Physical Review X

1. **Anomalous Landau Level Gaps Near Magnetic Transitions in Monolayer WSe_2**
B. Foutty *et al*., Phys. Rev. X **14**, 031018 (2024). *USM1300*

2. **Imaging Quantum Interference in a Monolayer Kitaev Quantum Spin Liquid Candidate**
Y. Kohsaka *et al*., Phys. Rev. X **14**, 041026 (2024). *USM1300*

Small Methods

1. **An Atomic-Scale Vector Network Analyzer**
S. Baumann *et al*., Small Methods **8**, 2301526 (2024). *USM1300*

2. **Br-Vacancies Induced Variable Ranging Hopping Conduction in High-Order Topological Insulator Bi_4Br_4**
Z. Gong *et al*., Small Methods **8**, 2400517 (2024). *SNOM1400*

Science Advances

1. **Supramolecular Scaffold-directed Two-dimensional Assembly of Pentacene into a Configuration to Facilitate Singlet Fission**
M. Fukumitsu *et al*., Sci. Adv. **10**, eadn7763 (2024). *TSP-2000*

2. **Room-Temperature Quantum Coherence of Entangled Multiexcitons in a Metal-Organic Framework**
A. Yamauchi *et al*., Sci. Adv. **10**, eadi3147 (2024). *USP-PSMM-NP*

Proc. Natl. Acad. Sci. USA

1. **Magnetochiral Tunneling in Paramagnetic $Co_{1/3}NbS_2$**
S. Lim *et al*., PNAS **121**, e2318443121 (2024). *USM1500*

2. **Realizing One-Dimensional Moiré Chains with Strong Electron Localization in Two-Dimensional Twisted Bilayer WSe_2**
Y. Ren *et al*., PNAS **121**, e2405582121 (2024). *USM1400*

Carbon

Orientational Alignment of Semiconducting Carbon Nanotubes by The Parallel Steps of High-Index Copper Foils
L. Li *et al*., Carbon **228**, 119329 (2024).

Nano Letters

1. **Quantitative Analogue Simulation of Planar Molecules**
N. Sharma *et al*., Nano Lett. **24**, 6658 (2024). *USM1500*

2. **Coexistence of Superconductivity and Antiferromagnetism in Topological Magnet $MnBi_2Te_4$ Films**
W. Yuan *et al*., Nano Lett. **24**, 7962 (2024). *USM1300*

3. **Spatially Dependent in-Gap States Induced by Andreev Tunneling through a Single Electronic State**
R. Zhong *et al*., Nano Lett. **24**, 8580 (2024). *USM1600*

4. **Observation of In-Gap States in a Two-Dimensional $CrI_2/NbSe_2$ Heterostructure**
P. Li *et al*., Nano Lett. **24**, 9468 (2024). *USM1300*

5. **Lifshitz Transition in a Single-Atom-Thick $Gd_xYb_{1-x}Pb_3$ Kagome Compound on Si(111)**
Y. Vekovshinin *et al*., Nano Lett. **24**, 9931 (2024). *USM1500*

6. **Proximity-Induced Superconductivity in a 2D Kondo Lattice of an f-Electron-Based Surface Alloy**
H. Kim *et al*., Nano Lett. **24**, 14139 (2024). *USM1300*

7. **High-Resolution Spectroscopy of the Intermediate Impurity States near a Quantum Phase Transition**
Y. Zhang *et al.*, Nano Lett. **24**, 14222 (2024). *USM1300*

8. **Interaction Effects and Non-Integer Pseudo-Landau Levels in Engineered Periodically Strained Graphene**
I. Rakic *et al.*, Nano Lett. DOI: 10.1021/acs.nanolett.4c03542

9. **Unconventional Charge-Density-Wave Gap in Monolayer NbS_2**
T. Knispel *et al.*, Nano Lett. **24**, 1045 (2024). *USM1300*

Physical Review Letters

1. **Gating Single-Molecule Fluorescence with Electrons**
K. Kaiser *et al*., Phys. Rev. Lett. **133**, 156902 (2024). *USM1400*

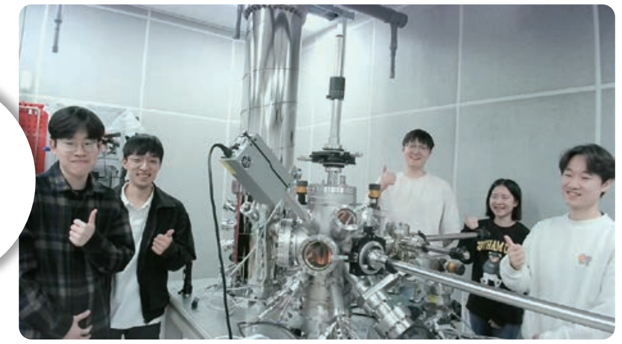
2. **Emergence of Exotic Spin Texture in Supramolecular Metal Complexes on a 2D Superconductor**
V. Vano *et al*., Phys. Rev. Lett. **133**, 236203 (2024). *USM1300*

3. **Local Excitation of Kagome Spin Ice Magnetism Seen by Scanning Tunneling Microscopy**
H. Deng *et al*., Phys. Rev. Lett. **133**, 046503 (2024). *USM1300*

4. **Large Orbital Moment and Dynamical Jahn-Teller Effect of AlCl-Phthalocyanine on Cu(100)**
C. Li *et al*., Phys. Rev. Lett. **133**, 126201 (2024). *USM1300*

Doohee Cho

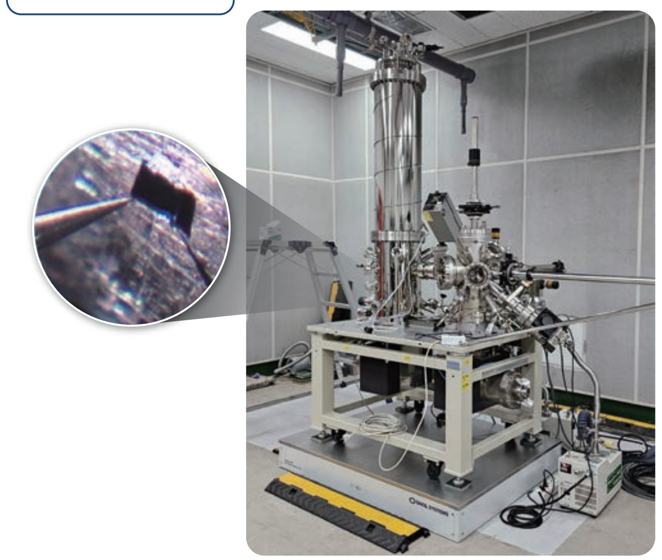
Department of Physics, Yonsei University,
Seoul, South Korea



Research Interests

- Van der Waals materials
- Charge (or Spin) density wave materials
- Strongly correlated systems
- Unconventional superconductors
- Charge dynamics (shot noise, Coulomb blockade,…)

USM1200



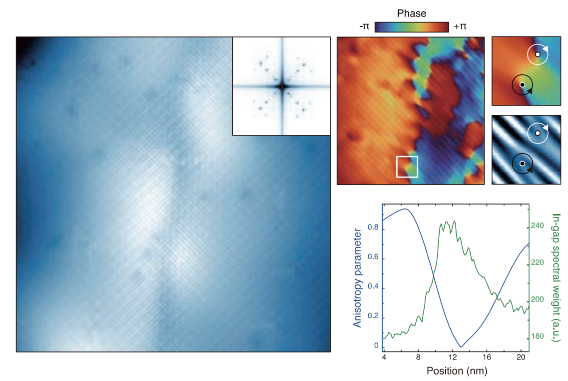
Features:

- Low-temperature STM (variable temperature)
- Base-temperature ~ 4.2 K
- Helium (10 L) holding time ~ 14 days
- In-situ low-temperature deposition

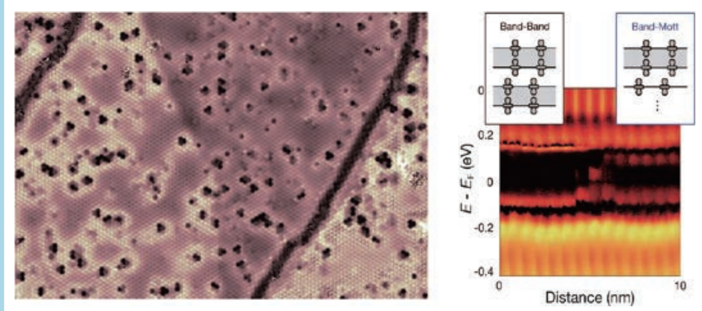
Selected References:

(1) S. Lee, E. Kim *et al*., Nano Lett., **23,** 11219 (2023).
(2) H. Yang, B. Lee *et al*., Adv. Sci., **11,** 2401348 (2024).
(3)M. Choi, G. Kim *et al*., ACS Nano, **18,** 15154 (2024).
(4) B. Lee, J. Bang *et al*., Phys. Rev. B **109,** 195170 (2024).

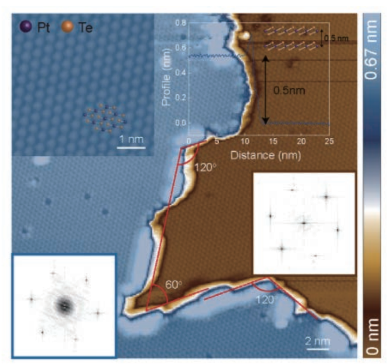
Melting of Unidirectional Charge Density Waves across Twin Domain Boundaries in $GdTe_3$



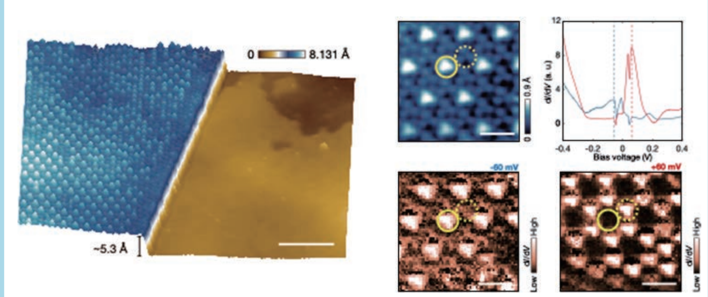
Origin of Distinct Insulating Domains in the Layered Charge Density Wave Material $1T\text{-}TaS_2$



Wafer-Scale Synthesis of Highly Oriented 2D Topological Semimetal $PtTe_2$ via Tellurization

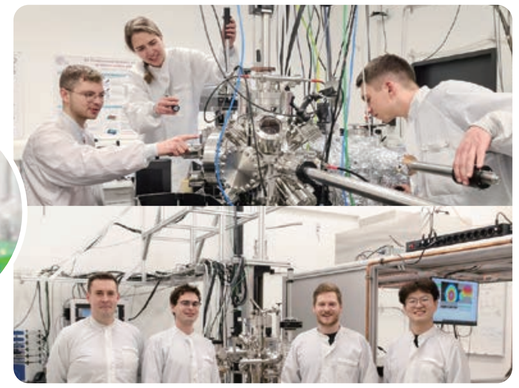


Charge-Ordered Phases in The Hole-Doped Triangular Mott Insulator $4Hb\text{-}TaS_2$



Rupert Huber

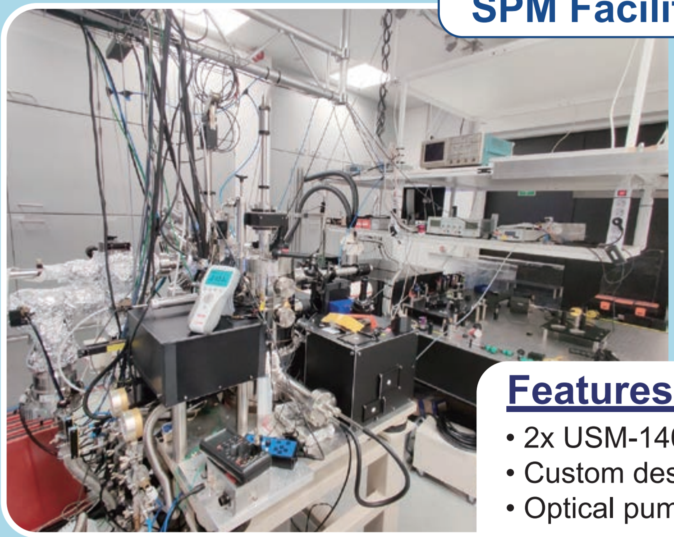
Regensburg Center for Ultrafast Nanoscopy (RUN)
University of Regensburg, Germany

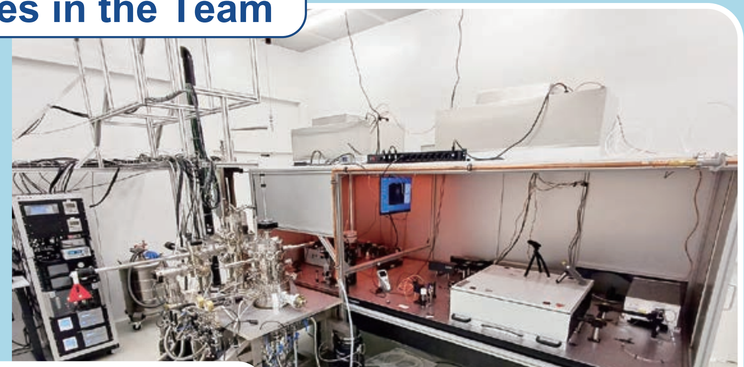


Research Interests

- Ultrafast elementary dynamics in quantum materials
- Strong-field physics & lightwave electronics
- Attosecond phenomena in condensed matter
- Lightwave-driven scanning probe microscopy & atomic resolution ultrafast videography

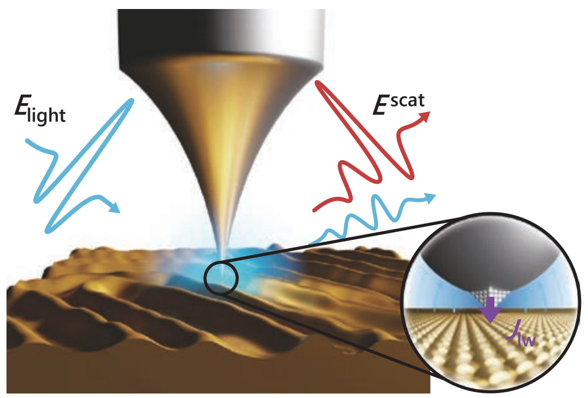
SPM Facilities in the Team





Features:

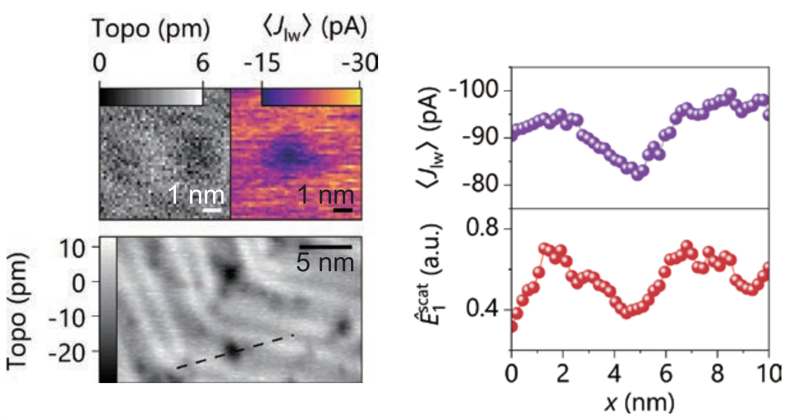
- 2x USM-1400
- Custom designed optical setups
- Optical pump/terahertz probe



The challenge:
Optical microscopy at the shortest possible length-and timescales

Our solution:
- THz pulses E_{light} drive ultrafast tunnelling currents J_{lw} between a tip and a sample[1-4]
- Detecting the emitted radiation E^{scat} with subcycle temporal resolution using electro-optic sampling[5] (EOS)

→ **Trace the quantum flow of electrons[6]**



NOTE = Near-field Optical Tunnelling Emission

- STM topography shows suppression of LDOS
- NOTE follows $\langle J_{lw} \rangle$
- Spatial resolution comparable to lightwave-STM

First optical microscopy with atomic-scale resolution (see ref. 6)

Selected References:

(1) T. L. Cocker *et al.*, Nature **539**, 263 (2016).
(2) Peller *et al.*, Nature **585,** 58 (2020).
(3) Peller *et al.*, Nat. Photon. **15,** 143 (2021).
(4) C. Roelcke *et al.*, Nat. Photon. **18**, 595 (2024).
(5) M. Plankl *et al.*, Nat. Photon. **15**, 594 (2021).
(6) T. Siday *et al.*, Nature **629**, 329 (2024).

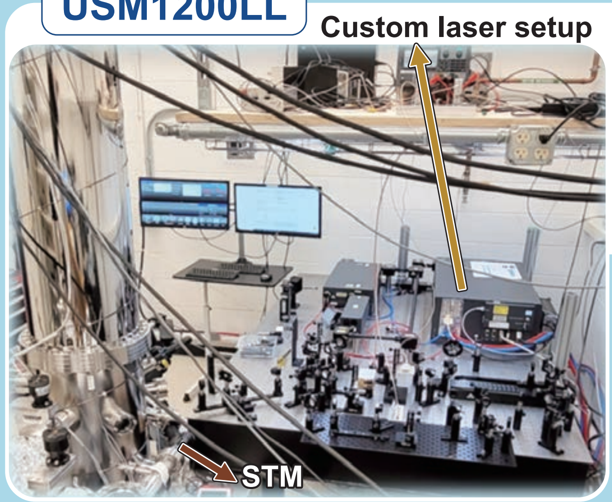
Vidya Madhavan

Donald Biggar Willett Professor, Dept. of Physics,
University of Illinois Urbana-Champaign, USA

Research Interests

- Scanning Tunneling Microscopy (STM) and Spectroscopy
- Laser-coupled, femtosecond time-resolved STM
- STM with spin-polarized and specialized nanowire probes
- STM of 2D thin films grown by molecular beam epitaxy
- Unconventional superconductors, topological insulators, and strongly correlated electron materials
- Twisted graphene and transition metal dichalcogenides

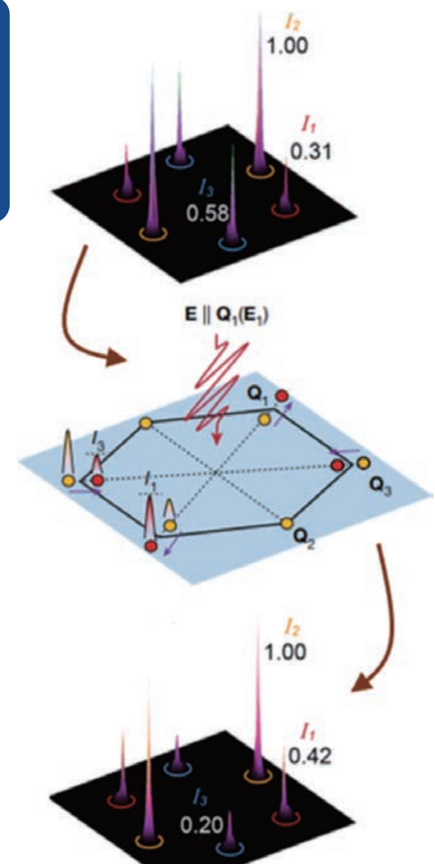
USM1200LL



Features:

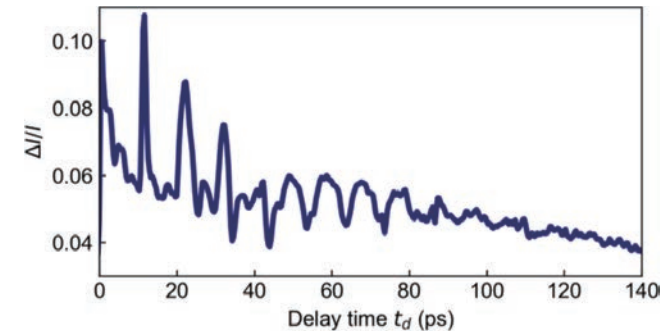
- Optical access integrating ultrafast pulsed laser with sub-ps time resolution
- Variable temperature STM capability between 4 K and room temperature
- Ultralow He consumption of ~1 L/day

Optical Manipulation of the Charge Density Wave in RbV_3Sb_5



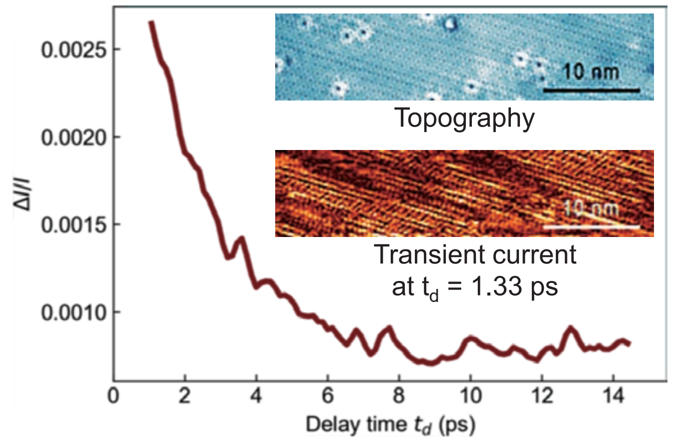
Linearly polarized laser illumination is used to reversibly manipulate[1] the strengths of the charge density wave (CDW) along different directions in RbV_3Sb_5; the changes in CDW intensity are subsequently probed at the atomic-scale with STM

Ultrafast Tunneling Current Oscillations from Charge Density Wave Phasons in $(TaSe_4)_2I$



Transient tunneling current as a function of delay time[2] between laser pulses illuminating $(TaSe_4)_2I$; ultrafast phase oscillations of the charge density wave arising at temperatures below ~90 K were detected by the STM tunneling current

Atomic-Scale Mapping of Ultrafast Dynamics in RbV_3Sb_5



Ultrafast relaxation of tunneling current after laser pulses was mapped on the atomic-scale in RbV_3Sb_5; unidirectional stripes along $4a_0$ CDW direction are prominent in the transient current

Selected References:

(1) Xing, Bae, *et al.*, Nature **631**, 60 (2024).
(2) Bae, Raghavan, *et al.*, *in preparation*

ユニソク創業の1974年どんな年？

甲寅

1 出来事

・長嶋茂雄が現役引退「我が巨人軍は永久に不滅です」
・ガッツ石松がボクシングWBC世界ライト級王座に
・ユリ・ゲラーが来日して超能力ブームが起こる
・宝塚大劇場初演をきっかけにベルばら(ベルサイユのばら)ブームが巻き起こる
・気象庁アメダスが運用開始
・セブンイレブン1号店が東京都江東区でオープン
・ハローキティが誕生

2 建築

The State Guest House, Akasaka Palace
迎賓館赤坂離宮として開館

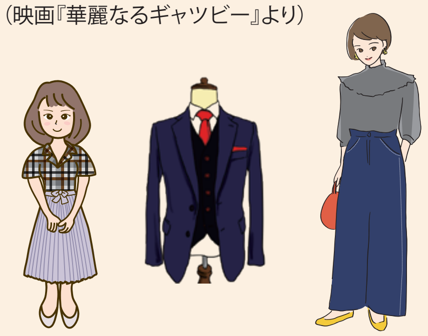
Paris-Charles-de-Gaulle Airport
シャルルドゴール空港　開港

3 新商品・ヒット商品

・カシオトロン(CASIO)
　デジタルウォッチに世界で初めてオートカレンダーを搭載
・VコードVTR KV-3000(東芝)
　世界初の1/2インチ式VTR
・ルマンド(北日本食品工業 / 現:ブルボン)
・あさげ(永谷園)
・蛍光ペン「暗記ペン蛍光」(トンボ鉛筆)
・電気もちつき機(東芝)
・幸福行き切符(国鉄)

4 ファッション

・プリーツスカート、エスカルゴスカート
・バギーパンツ、ベルボトム、フレアパンツ、ブリーチジーンズ(淡色のジーンズ)
・スリーピーススーツ(三つ揃えとも呼ばれる)
・ギャツビールック
(映画『華麗なるギャツビー』より)



5 邦楽ヒットソング

「やさしさに包まれたなら」	松任谷由実(荒井由実)
「ふれあい」	中村雅俊
「学園天国」	フィンガー5
「よろしく哀愁」	郷ひろみ
「想い出のセレナーデ」	天地真理
「愛の執念」	八代亜紀
「激しい恋」	西城秀樹
「ひと夏の経験」	山口百恵
「積木の部屋」	布施明
「闇夜の国から」	井上陽水
「グッド・バイ・マイ・ラブ」	アン・ルイス
「危ない土曜日」	キャンディーズ
「なみだの操」	殿様キングス
「あなた」	小坂明子
「うそ」	中条きよし

6 洋楽ヒットソング

"Please Mr. Postman"	Carpenters
"The Loco-Motion"	Grand Funk Railroad
"Waterloo"	Abba
"Sweet Home Alabama"	Lynyrd Skynyrd
"Killer Queen"	Queen
"Revolution"	Bob Marley
"The Way We Were"	Barbra Streisand
"Top of the World"	Carpenters
"Dancing Machine"	Jacson5
"Jet"	Paul McCartney & Wings
"Whatever Gets You Thru The Night"	John Lennon
"How Long"	Ace
"Candle In The Wind"	Elton John
"I Honestly Love You"	Olivia Newton-John
"Annie's Song"	John Denver

7 エンターテイメント

【洋画】ゴッドファーザーPART II
【洋画】エクソシスト
【洋画】燃えよドラゴン
【洋画】パピヨン
【洋画】華麗なるギャツビー
【邦画】日本沈没
【邦画】砂の器
【邦画】仁義なき戦い 完結篇
【邦画】ゴルゴ13
【アニメ】アルプスの少女ハイジ放映開始
【アニメ】宇宙戦艦ヤマト放映開始
【書籍】かもめのジョナサン
【書籍】ノストラダムスの大予言
【書籍】華麗なる一族
【書籍】エクソシスト

8 ナノテクノロジー概念の提唱

精密工学会主催　第1回生産技術国際会議で谷口紀男博士が、加工精度が1ナノメートル(nm)の製品を製造する総合生産技術をナノテクノロジーと定義した。谷口博士は「2000年には精密加工の精度が1ナノメートルほどになり、そのための総合生産技術が必要になる」と予測した。

1974 年度生まれのユニソク社員

社員にきく

ユニソクの雰囲気とはたらきやすさ

ユニソクで働く人たちはどんな人？

01 有給休暇は取得しやすいですか？

はい89%　いいえ11%

◆ 却下されたことがない
◆ 業務に支障がない限り許可が出る
◆ グループウェアで申請するので気軽に取得できる
◆ 社内の有給取得率が高いので休みを取るプレッシャーがない

02 仕事とプライベートの両立はできていますか？

はい76%　いいえ24%

◆ 終業時間が終わればすぐに帰宅というリズムになっていて、プライベートの予定を立てたり仕事以外の時間を大切にしやすい
◆ 仕事が忙しくなり残業が多くなることはありますが、自分の裁量で残業しているため、プライベートが犠牲になってはいない
◆ 有給休暇も取得しやすく、土日もきっちり休みのため
◆ 定時で帰れる
◆ 責任は伴うが、自分で仕事をコントロールできるようになれば定時に切り上げたりと時間は比較的自由に使える

03 現在の仕事を通じて成長できましたか？

はい89%　いいえ11%

◆ いろんな装置を触れる。いろんな国に行くことで知見が深まり、度胸がつく
◆ 新しい計測装置を開発することができる。
◆ 顧客とのやり取りの中でどのように物事を運べば納得してもらえるか、いつも考えるようになった。
◆ 技術習得は初心者からでも機会を与えてもらえたプログラミング、電気回路、仕事の進め方と振り方、具体的仕様の引き出し方、海外経験。システムの設計、製作、調整、納品まですべての工程を経験できたことで「作れる」という自信を持てるようになった。

04 自由にアイディアや意見を言える雰囲気はありますか？

はい97%　いいえ3%

◆ 半年に一度、社長と1対1でカジュアルに話をする機会が設けられている
◆ 社員、部長、社長の席が同じフロアのすぐ近くにあるので、何かあれば即相談できる
◆ 最終ゴールさえ間違えなければ自分のアイディアや意見を盛り込んでいける
◆ (自由に言えすぎて)アイディアの方が枯渇してきた

05 自由回答

Q1.どんな社員が多いですか？

温厚な人が多い / 優しく教え上手 / 控えめな方が多い印象 / 型にとらわれない人 / 多様性に富む、個性豊か / 集団への依存度が低い / 技術のことに熱心 / 技術や趣味に強い興味を持っている / 新しいことにチャレンジする積極的な人が多い / 研究室のような雰囲気

Q2.はたらきやすいポイントは？

許容範囲内で個人の都合や方針が尊重されている / 仕事のやり方を任せてもらえる / 責任はついてくるが自分のペースで仕事ができる / 過剰な残業をしてはいけない空気がある / 作業場の空気がギスギスしておらず、とてもあたたかい雰囲気がある / 居場所がある

Q3.仕事をしていて楽しいときは？

綺麗な原子像がみえるとき / お客さんの成果が出たときは嬉しい / 顧客の要求を図面化して完成させた時や装置のことでお話しする時は楽しいと感じます / 世界に一つの物を作りユーザー様に喜んでいただいた時 / 自分の手で組み上げた装置が不具合なく一発で動作した時 / 遊びに来ているわけではないので正直特に楽しいことは無い。ただ納品時に海外の景色が見られるのは楽しいかもしれない

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