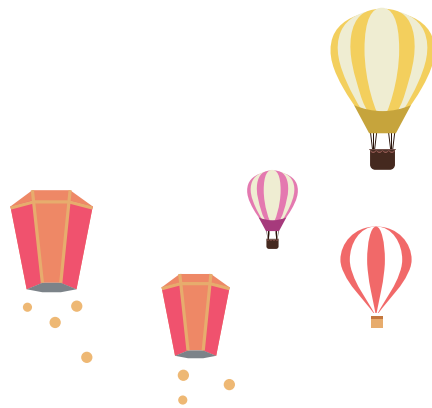




The 23rd Annual International Symposium
on Therapeutic Ultrasound

September 19-22, 2024

**Taipei International Convention Center
Taipei, Taiwan**



2024 PROGRAM BOOK
Welcome to Taipei!



September 19 - 22, 2024

**The 23rd Annual International Symposium
on Therapeutic Ultrasound**

Taipei, Taiwan

Welcome to the 23rd Annual International Symposium for Therapeutic Ultrasound! We are excited to gather scientists, engineers, clinicians and industry from around the world together in Taipei City, the lively capital city which is the economic, political, and cultural center of Taiwan, and also online via our Virtual Platform. We are honored to be joined by the Local Organizing Committee to host this year's meeting at the Taipei International Convention Center, right in the heart of Taipei, from 19 September to 22 September 2024.

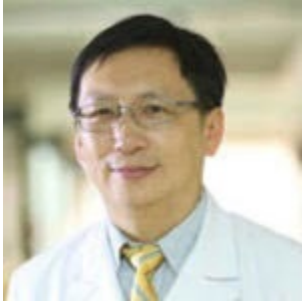
Whether you are attending in person or virtually, you will have full access to the Virtual Platform! There will be no live streamed content on the platform so you can watch the content anytime that works with your schedule. Presentations with pre-recorded content will be available on September 19th. A few sessions will be recorded live in Taipei and put on the platform within 24 hours of the session. **Content will be available for 6 months post-conference.** Use the platform to:

- Connect with presenters through the chat function, or leave them a message on the discussion board of their presentation.
- Watch recorded video content from oral and poster presenters
- View Posters by in-person and virtual presenters
- Visit Exhibition Booths from all of our Sponsors

Since the establishment of our Society in 2001, ISTU has laid the foundation for the continuous improvement and advancement of therapeutic ultrasound technology by providing the means for the international community in ultrasound to come together once every year to collaborate and share knowledge. ISTU 2024 will continue this tradition, and we sincerely hope this symposium will inspire new ideas and encourage innovations throughout all the different facets of this exciting field.

Local Organizing Committee Members

The 2024 Annual Symposium is proudly hosted by our Local Organizing Committee.



Chair

Wen-Shiang Chen, M.D., Ph.D.

Professor, National Taiwan University College of Medicine

Attending Physician, Department of Physical Medicine & Rehabilitation, National Taiwan University Hospital

President, Taiwan Association of Interventional and Therapeutic Ultrasound (TAITU)

President Elect, Asia Oceania Society of Physical and Rehabilitation Medicine (AOSPRM)



Secretary-General

Ming-Yen Hsiao, M.D., Ph.D., CIPS

Associate Professor,

National Taiwan University College of Medicine

Attending Physician,

Department of Physical Medicine & Rehabilitation, National Taiwan University Hospital

Scientific Committee Co-Chairs



Hao-Li Liu, Ph.D.

Professor, Department of Electrical Engineering
National Taiwan University



Zhen Xu

Professor, Biomedical Engineering
University of Michigan

Scientific Committee Members

- Vera Khokhlova (USA), University of Washington
- David Melodelima (FRANCE), INSERM
- Meaghan O'Reilly (CANADA), Sunnybrook Research Institute
- Dong-Guk Paeng (Korea), Jeju University
- Juan Tu (CN), Nanjing University
- Chih-Kuang Yeh (TW), National Tsing Hua University

Important Information

Registration / Information Desk

Visit us in the Main Foyer of the TICC. We're happy to help with anything you need. Our hours will be:

- Thursday, September 19: 13:00 – 17:00
- Friday, September 20 : 7:00 – 18:00
- Saturday, September 21: 7:00 – 17:00
- Sunday, September 22: 7:00 – 13:00

Certificates of Attendance

Attendees will receive an email after the conference with a link to download a Certificate of Attendance if needed.

Lost & Found

Should you lose or find anything, please report to the Information Desk for assistance.

Evaluation Survey

Please take a moment to complete a very short Evaluation Survey. Your feedback is very important for the development of future ISTU programs.





**The William and Francis Fry Honorary Fellowship
for Contributions to Therapeutic Ultrasound**

Pai-Chi Li, Ph.D.

Distinguished Professor, Department of Electrical Engineering
National Taiwan University

*Elasticity Measurements of 3D Cell Culture Systems:
Principles and Potential Applications to
Stiffness-Targeted Treatment Delivery*

The Frederic Lizzi Early Career Awards



Julianna C. Simon, Ph.D

Associate Professor, Graduate Program in Acoustics
Department of Biomedical Engineering (by courtesy)
The Pennsylvania State University

*Atomization, Boiling, and Cavitation:
The ABCs of Tissue Fractionation
by Focused Ultrasound*



Eli Vlaisavljevich, Ph.D.

Associate Professor
Kendall and Laura Hendrick Junior Faculty Fellow
Department of Biomedical Engineering
Virginia Polytechnic Institute and State University

*Snapshots from a Histotripsy Research Bubble:
From THERESA to Edison and Beyond*

*This year's Frederic Lizzi Early Career Award Session
is brought to you by Bracco.*



LIFE FROM INSIDE



Early Career Award Clinical Investigator Award

George R. Schade, M.D.

Associate Professor of Urology at the University of Washington

Prostate Histotripsy: Past, Present, and Future?

**ISTU 2024 Annual Symposium
Program Schedule
Taipei City, Taiwan**

Time	Thursday, September 19	Friday, September 20	Saturday, September 21	Sunday, September 22					
7:00 - 8:00		On-site Registration & Information Desk at Taipei International Convention Center	On-site Registration & Information Desk at Taipei International Convention Center	On-site Registration & Information Desk at Taipei International Convention Center					
8:00 - 9:00					Breakfast / Exhibits	Breakfast / Exhibits	Breakfast / Exhibits		
9:00 - 10:00					Education: FUS Basics	Education: AI in Ultrasound	Education: Treatment Monitoring		
10:00 - 11:00	EpiSonica Company Tour: 10:00 Departure from TICC				Opening Remarks	Fry, Lizzi & Early Clinical Award Session	Histotripsy	Treatment Monitoring	
11:00 - 12:00					Plenary Talks	Coffee Break / Exhibits			Coffee Break / Exhibits
12:00 - 13:00					Brain, Preclinical	Thermal Therapy	Student Award Talks	Drug / Gene Delivery	FUS Physics, Modeling and Hardware
13:00 - 14:00					Lunch	Posters / Exhibits	Student Award Posters Future of ISTU Poster Session	Debate: Immuno Stimulation: Thermal or Mechanical?	Student Award Announcements / Closing Remarks
14:00 - 15:00					ISTU and FUS Foundation Brain Clinical Session	ISTU and FUS Foundation Body Clinical Session	ISTU and FUS Foundation Body Clinical Session	2024 ISTU NaviFUS Day: 14:00	TAITU Symposium
15:00 - 16:00	Brain Clinical Panel				Body Clinical Panel	Body Clinical Panel	Departure from TICC NaviFUS Company Tour Times: 14:30-16:00 (30 minutes per group)		
16:00 - 17:00	Posters				Posters	Posters	FUS Symposium Time: 16:00-18:00		
17:00 - 18:00	Immunotherapy	Emerging Technology	Student Mentorship Session						
18:00 - 19:00	Welcome Reception at TICC			TAITU Banquet					
19:00 +			Gala Event at Taipei New Horizon						

Thursday, September 19

Start - End Time	Session Title	Location
10:00 AM - 2:00 PM	EpiSonica Company Tour	EpiSonica
1:00 PM - 5:00 PM	Early Registration / Information Desk	Main Entrance Foyer

Friday, September 20

7:00 AM - 6:00 PM	Early Registration / Information Desk	Main Entrance Foyer
7:30 AM - 8:00 AM	Breakfast / Exhibits	1st Floor of TICC
7:30 AM - 8:30 AM	Education 1: FUS Basics	101
	Robin Cleveland, University Of Oxford: <i>Using Lenses to Focus Ultrasound in the Brain</i>	
	Adam Maxwell, Virginia Tech: <i>The ABCs of Mechanical FUS: Interactions of Acoustics, Bubbles, and Cells</i>	
8:30 AM - 9:00 AM	Opening Remarks	101
9:00 AM - 10:00 AM	Plenary Talks	101
	Kullervo Hynynen, Ph.D., Sunnybrook Research Institute/ University of Toronto: <i>Expanding Use of Focused Ultrasound for Brain Treatments</i>	
	Adam Maxwell, Virginia Tech: <i>The ABCs of Mechanical FUS: Interactions of Acoustics, Bubbles, and Cells</i>	
10:00 AM - 10:30 AM	Coffee Break / Exhibits	1st Floor of TICC
10:30 AM - 12:00 PM	Brain, Preclinical	101
10:30 AM - 12:00 PM	Thermal Therapy	102
12:00 PM - 1:00 PM	Lunch	4th Floor Banquet Hall
12:00 PM - 1:00 PM	Posters / Exhibits	1st Floor of TICC
1:00 PM - 2:30 PM	Brain Clinical Session: Brought to you by FUS Foundation and ISTU	101
2:30 PM - 3:00 PM	Brain Clinical Panel: Brought to you by FUS Foundation and ISTU	101
3:00 PM - 4:30 PM	Posters	1st Floor of TICC
4:00 PM - 4:30 PM	Coffee Break / Exhibits	1st Floor of TICC
4:30 PM - 6:00 PM	Immunotherapy / Oncology / Combination Therapy	101
4:30 PM - 6:00 PM	Emerging Technology	102
6:00 PM - 8:30 PM	Welcome Reception brought to you by Verasonics	4th Floor Banquet Hall

Saturday, September 21

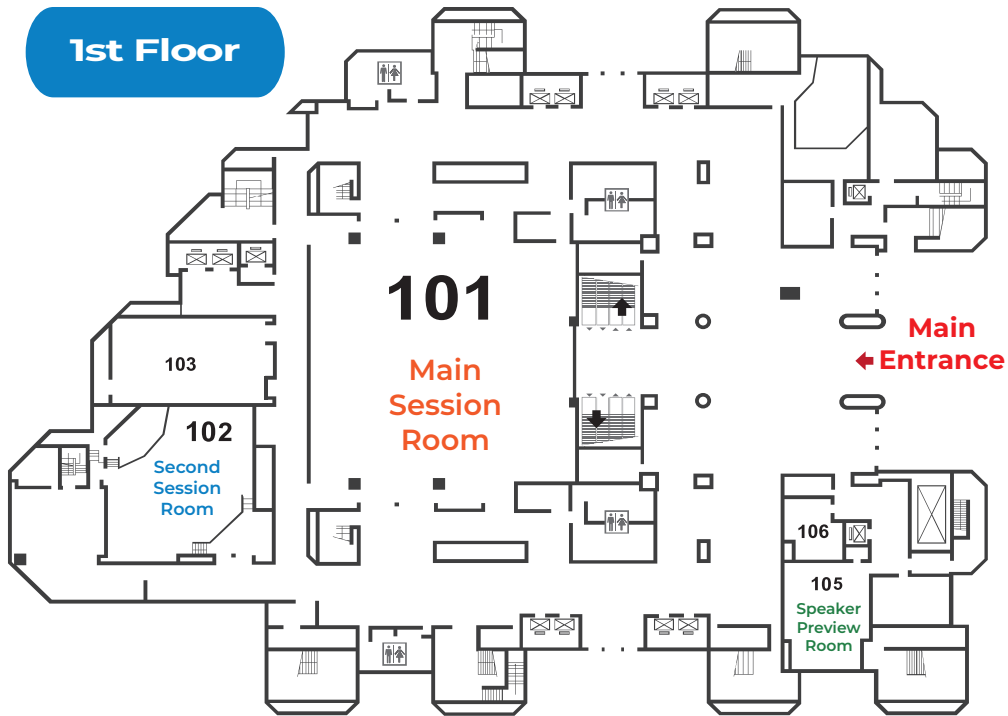
7:00 AM - 5:00 PM	Early Registration / Information Desk	Main Entrance Foyer
7:00 AM - 7:30 AM	Breakfast / Exhibits	1st Floor of TICC
7:30 AM - 8:00 AM	Education 2: AI in Ultrasound	101
	Dong-Guk Paeng, Ph.D., Jeju National University: <i>Navigating the Future of Transcranial Focused Ultrasound: AI-Driven Innovations</i>	
8:00 AM - 9:30 AM	ISTU Annual Awards	101
8:00 AM - 8:30 AM	The William and Francis Fry Honorary Fellowship for Contributions to Therapeutic Ultrasound	101
	Pai-Chi Li, Ph.D., National Taiwan University: <i>Elasticity Measurements of 3D Cell Culture Systems: Principles and Potential Applications to Stiffness-Targeted Treatment Delivery</i>	

Start - End Time	Session Title	Location
8:30 AM - 9:10 AM	The Frederic Lizzi Early Career Awards brought to you by Bracco	101
	Julianna C. Simon, Ph.D., The Pennsylvania State University: <i>Atomization, Boiling, and Cavitation: The ABCs of Tissue Fractionation by Focused Ultrasound</i>	
	Eli Vlaisavljevich, Ph.D., Virginia Polytechnic Institute and State University: <i>Snapshots from a Histotripsy Research Bubble: From THERESA to Edison and Beyond</i>	
9:10 AM - 9:30 AM	Early Career Clinical Investigator Award	101
	George R. Schade, M.D., University of Washington: <i>Prostate Histotripsy: Past, Present, and Future?</i>	
9:30 AM - 10:00 AM	Coffee Break / Exhibits	1st Floor of TICC
10:00 AM - 11:30 AM	Student Award Talks	101
11:30 AM - 12:00 PM	Student Award Posters / Future of ISTU Poster Session	103
12:00 PM - 1:00 PM	Lunch	4th Floor Banquet Hall
12:00 PM - 1:00 PM	Posters / Exhibits	1st Floor of TICC
1:00 PM - 2:30 PM	Body Clinical Session: Brought to you by FUS Foundation and ISTU	101
2:30 PM - 3:00 PM	Body Clinical Panel: Brought to you by FUS Foundation and ISTU	101
3:00 PM - 4:00 PM	Posters	1st Floor of TICC
4:00 PM - 4:30 PM	Coffee Break / Posters / Exhibits	1st Floor of TICC
4:30 PM - 5:00 PM	ISTU General Assembly and FUS Foundation Awards Session	101
5:00 PM - 6:00 PM	Student Mentorship Session	101
7:00 PM - 10:00 PM	Gala Event: Tickets may still be available ~ Check with Information Desk!	Taipei New Horizon Top Floor 14F
Sunday, September 22		
7:00 AM - 7:30 AM	Breakfast / Exhibits	1st Floor of TICC
7:30 AM - 8:30 AM	Education 3: Treatment Monitoring	101
	Steven P. Allen, Ph.D., Brigham Young University: <i>Magnets Under Pressure: Using Magnetic Resonance to Advance Therapeutic Ultrasound</i>	
	Mathieu Pernot, Physics for Medicine, INSERM: <i>Ultrasound Based Monitoring of FUS Treatments</i>	
8:30 AM - 10:00 AM	Histotripsy	101
8:30 AM - 10:00 AM	Treatment Monitoring	102
10:00 AM - 10:30 AM	Coffee Break / Exhibits	1st Floor of TICC
10:30 AM - 12:00 PM	Drug / Gene Delivery	101
10:30 AM - 12:00 PM	FUS Physics, Modeling and Hardware	101
12:00 PM - 12:30 PM	Annual ISTU Debate: Immuno Stimulation: Thermal or Mechanical?	101
	Thermal: Tatiana Khokhlova, Ph.D., University of Washington	
	Mechanical: Natasha D. Sheybani, Ph.D., University of Virginia	
12:30 PM - 1:00 PM	Student Award Announcement / Closing Remarks	101
1:00 PM - 6:00 PM	TAITU Symposium: Taiwan Japan Korea Therapeutic Ultrasound Forum	TICC 201BC
2:00 PM - 4:00 PM	NaviFUS Day: Company Tour	NaviFUS
4:00 PM - 6:00 PM	NaviFUS Day: International Academic FUS Symposium	NaviFUS
6:00 PM - 8:00 PM	TAITU Banquet	Grand Hyatt Taipei

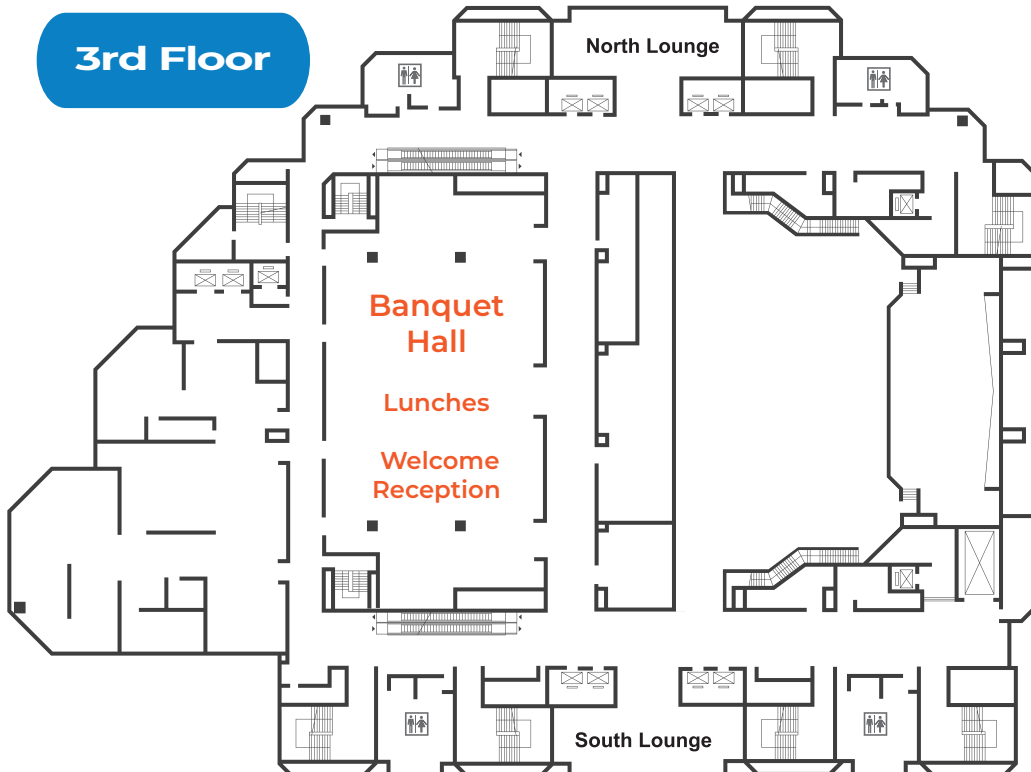


Visit the sponsor exhibits and view posters throughout the 1st floor!

1st Floor



3rd Floor



The Focused Ultrasound Foundation accelerates the development and adoption of the technology by:

- Funding research
- Fostering collaboration
- Working to overcome barriers to commercialization



fusfoundation.org

Apply for Research Funding

The Foundation funds **preclinical and clinical projects** that involve or advance noninvasive image-guided focused ultrasound.

Priority **indications** include:

- neurodegenerative diseases
- cancer
- cancer immunotherapy

Priority **mechanisms of action** include:

- immunomodulation
- neuromodulation
- sonodynamic therapy
- gene therapy
- drug delivery

New Application Site



All application materials should be submitted via **ProposalCentral**.



NaviFUS is a tech-humanist

We make innovative and human-centered technology that can transform CNS disease patients' lives.

NaviFUS®

Neuronavigation-Guided Focused Ultrasound System

The NaviFUS® is a focused ultrasound technology platform that provides personalized and transformative solutions for brain diseases like glioblastoma and epilepsy. It can non-invasively open the blood-brain-barrier to allow large-molecular weight drug delivery to previously unreachable parts of the brain and suppress seizures in epilepsy patients.

Patient-Friendly
Treatment Experience

Precise
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NaviFUS | Navigate *Life*



Explore NaviFUS®

Prodigy
HIFU256



Programmable High Power Array System



Prodigy
256

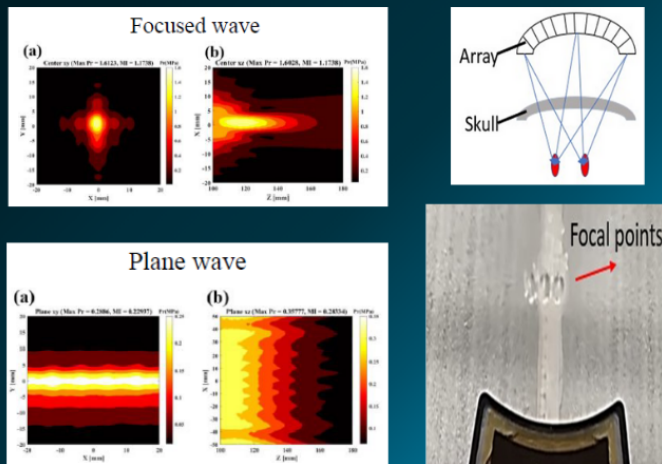
Open Array Imaging Platform

Therapeutic Ultrasound Research

- Frequency 50 KHz~30 MHz
- Bipolar Pulses
- 256 Physical Channels
- Voltage 40 ~ 180Vpp
- Time Delay Accuracy 2.8 ns
- Up to 11.5 W Per Channel in Continuous Mode
- More than 15 W Per Channel in Pulsed Mode
- PC Control or Integrated with Prodigy256 for Image-guided Therapy
- Versatile Applications: HIFU, Cavitation, ARFI/SWEI push, BBB opening, Histotripsy... etc.

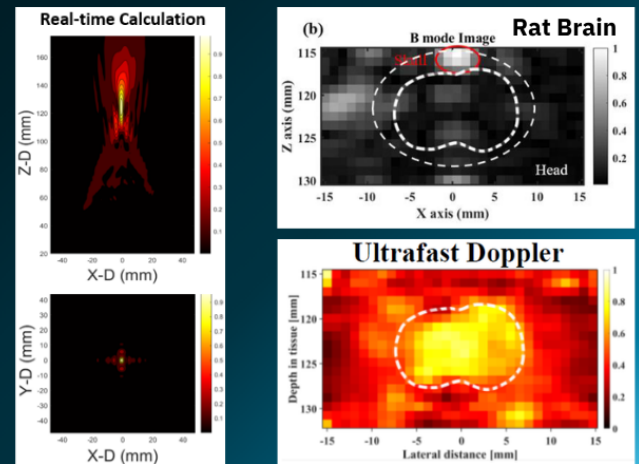
Arbitrary Delay Curve

Prodigy HIFU256 supports to generate arbitrary steering beams or plane waves using the arbitrary delay curve setting feature



Theranostic Ultrasound

Developing theranostic focused ultrasound on separated transducer design for passive acoustic mapping (PAM) and versatile ultrasound imaging on CNS applications using Prodigy HIFU256 with Prodigy256



** Tzu-Tsen Hsieh, Yung-Han Lee, Bao-Yu Hsieh, Hao-Li Liu, "Low Frequency Vascular Analysis of Dual Mode Transcranial Focused Ultrasound Induced Brain Stimulation."



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**Incision-Free Ablative
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 **EpiSonica**

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Precise positioning | Real-time thermal monitoring

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Patented Arc Design

- ✔ Portable / Add-on, easily mounted onto the MRI Bed
- ✔ Top mounted transducer with water bag closely contact with patient's skin surface reduces the risk of skin burn
- ✔ Transducer moves along 3-axes offers wider angle of operation for precise positioning

Combined with MRI

- ✔ **Precise anatomy image guiding**
Precisely target lesion to avoid high risk area ensuring safety
- ✔ **Real-time thermal monitoring**
Continuous temperature monitoring during treatment and confirm the efficacy of thermal ablation and avoid over-treatment

Pain Palliation for Bone Metastasis

Uterine Fibroids



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