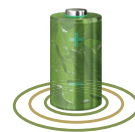


ORGANIC BATTERY DAYS



OBD Workshop Program

October 13 – 14, 2022

Houston, Texas, USA

GENERAL INFORMATION

Date

October 13-14, 2022

Venue

Elizabeth D. Rockwell Pavilion, MD Anderson Library, 2nd floor
4333 University Drive, Houston, TX 77204, USA

Website: <https://orgabattdays.ece.uh.edu/>

Chairman

Prof. Yan Yao

Department of Electrical & Computer Engineering and TcSUH, University of Houston, Houston, Texas, USA

Organization Committee

Ms. Susan Butler (University of Houston, USA)

Mr. Liqun Guo (ECS UH Student Chapter, USA)

Dr. Alae Eddine Lakraychi (University of Houston, USA)

Prof. Jodie Lutkenhaus (Texas A&M University, USA)

Dr. Wei Wang (Pacific Northwest National Laboratory, USA)

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Prof. Philippe Poizot (Université de Nantes, France)

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Dr. Wei Wang (Pacific Northwest National Laboratory, USA)

Dr. Masaru Yao (National Institute of Advanced Industrial Science and Technology, Japan)

Prof. Yan Yao (University of Houston, USA)



ORGANIC BATTERY DAYS

University of Houston | October 13–14, 2022



WELCOME

Dear Friends and Colleagues,

Welcome to the 5th Organic Battery Days at the University of Houston on October 13–14, 2022. We are pleased to continue the series of Organic Battery Days events that started in Uppsala, Sweden, in 2017, and this is the first time that Organic Battery Days is being held in the United States!



Building on the success of previous meetings, this year's event aims to strengthen communication and cooperation among experts from academic organizations, research institutes, and manufacturing companies, as well as to exchange knowledge and experience on the most recent developments in the field of organic batteries. The meeting will discuss the design and synthesis of organic electroactive materials, the study of these materials in various electrochemical systems (e.g., rechargeable batteries, flow cells), and electrolytes for organic electrodes. This meeting will be held in person.

Our graduate students and young professionals have generously volunteered their time and talents to help plan and implement this Workshop. They have provided invaluable thought and initiative to assure you will have a meaningful visit and stand ready to assist you during your stay.

I look forward to an inspiring meeting that will generate novel ideas in this exciting field of research and development.

Sincerely,

Yan Yao

OBD2022 Chairman

Hugh Roy and Lillie Cranz Cullen Distinguished Professor, Electrical and Computer Engineering; Texas Center of Superconductivity at the University of Houston (TcSUH), University of Houston



WEDNESDAY 10/12	THURSDAY 10/13	FRIDAY 10/14	SATURDAY 10/15
	7:00 – 8:30 a.m. Breakfast + late registration (Hilton Shamrock BC)	7:00 – 8:30 a.m. Breakfast (Hilton Shamrock BC)	8:00 a.m. – 1:30 p.m. NASA/Johnson Space Center Tour
	9:15 – 9:30 a.m. (ERP) Welcome and Opening Remarks	9:10 – 10:15 a.m. (ERP) Session D: Virtual Poster	
	9:30 – 10:10 a.m. (ERP) Plenary Lecture		
	10:10 – 10:15 a.m. (ERP) Greetings from the University of Houston		
	10:15 – 10:55 a.m. (ERP) Plenary Lecture	10:15 – 10:30 a.m. (ERP) Coffee/Tea Break	
	10:55 – 11:10 a.m. (ERP) Coffee/Tea Break	10:30 – 11:10 a.m. (ERP) Plenary Lecture	
	11:10 am – 12:40 p.m. (ERP) Session A: Material Discovery	11:10 a.m. – 12:40 p.m. (ERP) Session E: Redox Flow Battery	
	12:40 – 2:00 p.m. Lunch Buffet (MD Anderson Library)	12:40 – 2:00 p.m. Lunch Buffet (MD Anderson Library)	
2:00 – 6:00 p.m. Registration (Hilton Lobby)	2:00 – 3:45 p.m. (ERP) Session B: Underlying Mechanism	2:00 – 3:45 p.m. (ERP) Session F: Emerging Applications	
	3:45 – 4:00 p.m. (ERP) Coffee/Tea Break	3:45 – 4:00 p.m. (ERP) Coffee/Tea Break	
	04:00 – 5:45 p.m. (ERP) Session C: Multivalent Systems	4:00 – 5:20 p.m. (ERP) Session G: Physical Properties 5:20 – 5:40 p.m. (ERP) Poster Awards & Closing Remarks	
6:30 – 9:00 p.m. Welcome to Houston BBQ (Student Center Ballroom)	6:30 – 9:00 p.m. Conference Dinner (Hilton Shamrock BC)	7:00 – 9:30 p.m. Board & Invited Speakers' Dinner (Brennan’s of Houston)	

(ERP): Elizabeth Rockwell Pavilion – M.D. Anderson Library



OBD WORKSHOP PROGRAM

– Wednesday, OCTOBER 12, 2022

2:00 – 6:00 p.m.	Registration Hilton Main Lobby Near Hotel Registration Desk
6:15 p.m.	Meet in South Lobby at Main Entrance for Escort to BBQ
6:30 – 9:00 p.m.	Welcome to Houston BBQ Student Center Ballroom – 2 nd Floor, New South Wing

– Thursday, OCTOBER 13, 2022

Hilton University of Houston

7:00 – 8:30 a.m.	Breakfast Buffet Open. Late registration outside room. (Hilton Shamrock BC)
8:30 a.m.	Meet in the South Lobby 1 st floor for escort to Elizabeth D. Rockwell Pavilion, M.D. Anderson Library using Lynn Eusan Park Exit

Elizabeth D. Rockwell Pavilion – M.D. Anderson Library

9:00 a.m.	Doors open – Take seats
9:15 – 9:30 a.m.	Welcome and Opening Remarks Yan Yao, OBD 2022 Chair, University of Houston & TcSUH, Houston, Texas, USA Greetings from the UH Cullen College of Engineering Joseph Tedesco, Dean
9:30 – 10:10 a.m.	PL1 Plenary Lecture Polymers for High Power Density Organic Batteries Kenichi Oyaizu, Waseda University, Japan
10:10 – 10:15 a.m.	Greetings from the University of Houston Claudia Neuhauser, Interim Vice Chancellor/Vice President for Research
10:15 – 11:55 a.m.	PL2 Plenary Lecture Novel Architectures and Experimental Strategies for Organic Electrical Energy Storage Héctor D. Abruña, Cornell University, USA
10:55 – 11:10 a.m.	Coffee/Tea Break



11:10 a.m. – 12:40 p.m.

SESSION A: Material Discovery

Chair: Jodie Lutkenhaus

11:10 – 11:35 a.m.

IT1 Invited Talk

Discovering New Organic Electrodes

Chen Liao, Argonne National Laboratory, USA

11:35 a.m. – 12:00 p.m.

IT2 Invited Talk

Designing Organic Small Molecules for High-Performance Electrode Materials

Ji Eon Kwon, Korea Institute of Science and Technology, Republic of Korea

12:00 – 12:15 p.m.

CT1 Contributed Talk

Four Electron Exchange on Benzene Ring

Klemen Pirnat, National Institute of Chemistry, Slovenia

12:15 – 12:40 p.m.

IT3 Invited Talk

Chemical and Structural Principles for High-Voltage Organic Li-ion Cathodes: the Case of Conjugated Sulfonamides and their Derivatives

Alexandru Vlad, Université Catholique de Louvain, Belgium

12:40 – 2:00 p.m.

Lunch Buffet

Elizabeth D. Rockwell Pavilion

2:00 – 3:45 p.m.

SESSION B: Underlying Mechanism

Chair: Yanliang Liang

2:00 – 2:25 p.m.

IT4 Invited Talk

Polymorphism and Electrochemical Behavior of Organic Electrodes Materials

Philippe Poizot, Université de Nantes, France

2:25 – 2:50 p.m.

IT5 Invited Talk

Towards the Applicability of Density Functional Tight Binding to Charge Transport in Quinones in Solution and in the Solid State

Puja Goyal, State University of New York at Binghamton, USA

2:50 – 3:15 p.m.

IT6 Invited Talk

Polymer Particles Containing Redox-Active Organo-Disulfides and Their Potential Application in Organic Batteries

Shrayesh N. Patel, University of Chicago, USA

3:15 – 3:30 p.m.

CT2 Contributed Talk

Halogenated Carboxylates as Organic Anodes for Stable and Sustainable Sodium-Ion Batteries

Jinghao Huang, George Mason University, USA



3:30 – 3:45 p.m. **CT3 Contributed Talk**
 Tuning and Improving Active Electrode Materials Thanks to Organic Chemistry Toolbox
 Valentin Gouget, Université de Grenoble Alpes, France

3:45 – 4:00 p.m. **Coffee/Tea Break**

4:00 – 5:45 p.m. **Chair : Alae Eddine Lakraychi**
SESSION C: Multivalent Systems

4:00 – 4:25 p.m. **IT7 Invited Talk**
 Organic Electrode Materials for Divalent Metal-ion Batteries
 Zhirong Zhao-Karger, Helmholtz Institute Ulm, Germany

4:25 – 4:40 p.m. **CT4 Contributed Talk**
 Organic Magnesium Batteries: The Way to Commercialization?
 Yanliang Liang, LiBeyond, USA

4:40 – 4:55 p.m. **CT5 Contributed Talk**
 Polymers Derived from Aromatic Dianhydrides as Promising Cathodes for
 Rechargeable Ca-Metal Batteries
 Olivera Lužanin, University of Ljubljana, Slovenia

4:55 – 5:20 p.m. **IT8 Invited Talk**
 Mechanics of Organic Mixed Ionic-Electronic Conductors
 Kejie Zhao, Purdue University, USA

5:20 – 5:45 p.m. **IT9 Invited Talk**
 Organic/Aqueous Hybrid Electrolytes for Reversible Zn and Al Deposition of
 Zn Metal and Zn-Al Alloy Anodes
 Ho Seok Park, Sungkyunkwan University, Republic of Korea

6:30 – 9:00 p.m. **Conference Dinner**

– Friday, OCTOBER 14, 2022

Hilton University of Houston

7:00 – 8:30 a.m. Breakfast Buffet Open. Late registration outside room. (Hilton Shamrock BC)

8:30 a.m. Meet in the South Lobby 1st floor for escort to Elizabeth D. Rockwell Pavilion, M.D.
 Anderson Library, using Lynn Eusan Park Exit

Elizabeth D. Rockwell Pavilion – M.D. Anderson Library

9:00 a.m. Doors open – Take seats



9:10 – 10:15 a.m.

SESSION D: Virtual Poster

Chair: Yan Yao

9:10 – 9:15 a.m.

P1 Poster Presentation

Bioinspired and Biodegradable Redox-active Polypeptides: From Ring-opening Polymerization of N-Carboxyanhydrides for Sustainable Energy Storage
Shih-Guo Li, Texas A&M University, USA

9:15 – 9:20 a.m.

P2 Poster Presentation

Engineered Slide-Ring Materials for Energy Storage Applications
Jackson Pope, University of Colorado Boulder, USA

9:20 – 9:25 a.m.

P3 Poster Presentation

Bio-based High-Voltage Polyhydroxyanthraquinones as Organic Cathode Material for Batteries
Tijs Lap, University of the Basque Country, Spain

9:25 – 9:30 a.m.

P4 Poster Presentation

Cyclotetrabenzil Macrocyclic Based Lithium-ion Chemistry
Jianing Meng, University of Houston, USA

9:30 – 9:35 a.m.

P5 Poster Presentation

High Spatial Resolution Quantitative Chemo-Mechanical Mapping of Organic Composite Cathode for Sulfide-Based Solid-State Batteries
Qing Ai, Rice University, USA

9:35 – 9:40 a.m.

P6 Poster Presentation

Studying Superlithiation with Proton Free Terephthalates
Zackary Ashworth, Uppsala University, Sweden

9:40 – 9:45 a.m.

P7 Poster Presentation

Building a Full Li-ion Prototype Using a Lithiated Organic Active Material For the Positive Electrode
Maxime Nicolas, CEA de Grenoble, France

9:45 – 9:50 a.m.

P8 Poster Presentation

Lithium-Phenolate (Metal-)Organic Cathodes
Rambabu Darsi, Université Catholique de Louvain, Belgium

9:50 – 9:55 a.m.

P9 Poster Presentation

Size-Selective Covalent Organic Framework (COF) Composite Membrane to Overcome the Shuttle Effect in Organic Batteries
Erin S. Picton, University of Houston, USA

9:55 – 10:00 a.m.

P10 Poster Presentation

Redox Active Disulfide Crosslinked Polymeric Particles For Energy Storage Application
Hongyi Zhang, University of Chicago, USA



- 10:00 – 10:05 a.m. **P11 Poster Presentation**
Using Dynamic Crosslinks in Redox Active Colloids to Enable Electrode Cleaning
Sam Kopfinger, University of Chicago, USA
- 10:05 – 10:10 a.m. **P12 Poster Presentation**
Machine Learning-Accelerated Multiscale Modeling of Radical-Containing
Polymers for All-Organic Batteries
Riccardo Alessandri, University of Chicago, USA
- 10:10 – 10:15 a.m. **P13 Poster Presentation**
Effect of Stereoregularity on the Electrochemical Properties of Poly(vinylcarbazole)
Khirabdh T. Mohanty, Texas A&M University, USA

10:15 – 10:30 a.m. **Coffee/Tea Break**

10:30 a.m. – 12:40 p.m.
SESSION E: Redox Flow Batteries

Chair: Wei Wang

- 10:30 – 11:10 a.m. **P3 Plenary Lecture**
Recent Progress in Aqueous Organic Flow Batteries
Michael J. Aziz, Harvard School of Engineering and Applied Sciences, USA
- 11:10 – 11:35 a.m. **IT10 Invited Talk**
Atomistic Modelling and Data-driven Approaches for Molecular Discovery
Rajeev S. Assary, Argonne National Laboratory, USA
- 11:35 a.m. – 12:00 p.m. **IT11 Invited Talk**
Reversible Ketone Hydrogenation and Dehydrogenation for Aqueous Organic
Redox Flow Batteries
Ruozhu Feng, Pacific Northwest National Laboratory, USA
- 12:00 – 12:25 p.m. **IT12 Invited Talk**
Predicting the Solubility of Organic Energy Storage Materials Based on Functional
Group Identity and Substitution Pattern
Shiyu Zhang, The Ohio State University, USA
- 12:15 – 12:40 p.m. **CT6 Contributed Talk**
Investigation of Bipolar Isoindoline Nitroxide Materials for Nonaqueous Redox
Flow Batteries
James P. Blinco, Queensland University of Technology, Australia

12:40 – 2:00 p.m. **Lunch Buffet**
Elizabeth D. Rockwell Pavilion



2:00 – 3:45 p.m.

Chair: Philippe Poizot

SESSION F: Emerging Applications of Organic Active Molecules

2:00 – 2:25 p.m.

IT13 Invited Talk

Industrial Perspectives on Organic Batteries for Energy Storage
 Ryan M. Stephens, Shell International Exploration and Production, USA

2:25 – 2:50 p.m.

IT14 Invited Talk

Redox Gating Achieves New Electrostatic and Ionic Doping Limits
 Wei Chen, Argonne National Laboratory, USA

2:50 – 3:05 p.m.

CT7 Contributed Talk

Towards an Organic Electrode Without Conductive Carbon for Lithium-ion Battery
 Vincent Pignier, Université de Picardie Jules Verne, France

3:05 – 3:20 p.m.

CT8 Contributed Talk

Soluble Organic Catalysts for Non-Aqueous Lithium-Air Batteries
 Stéven Renault, Université de Nantes, France

3:20 – 3:45 p.m.

IT15 Invited Talk

Bioorganic Films for Cleaner Energy Production
 Charuksha Walgama, University of Houston, USA

3:45 – 4:00 p.m.

Coffee/Tea Break

4:00 – 5:45 p.m.

Chair: Alexandru Vlad

SESSION G: Physical Properties

4:00 – 4:25 p.m.

IT16 Invited Talk

Improved Rate Performance and Energy Density in Conjugated Polymers with Mixed Ionic-Electronic Conduction
 Rafael Verduzco, Rice University, USA

4:25 – 4:50 p.m.

IT17 Invited Talk

An Ultrafast, Durable, and High-Loading Polymer Anode for Aqueous Zinc-Ion Batteries and Supercapacitors
 Xiaolei Wang, University of Alberta, Canada

4:50 – 5:05 p.m.

CT9 Contributed Talk

Structural Lithium-ion Battery Cathodes based on Organic Redox Active Polymers and Kevlar Aramid Nanofibers
 Suyash Oka, Texas A&M University, USA

5:05 – 5:20 p.m.

CT10 Contributed Talk

Engaging Electrochemists: An Introduction to The Electrochemical Society
 Shannon C. Reed, The Electrochemical Society, USA



5:20 – 5:40 p.m.

Poster Awards and Closing Remarks

7:00 – 9:30 p.m.

Board & Invited Speakers' Dinner (Brennan's of Houston)

Meet in Hilton South Lobby by main entrance for transportation

– Saturday, OCTOBER 15, 2022**NASA/Johnson Space Center Private Tour – Space Center Houston**

8:00 a.m.

Meet at the sidewalk by the Hilton's main entrance, located at Entrance 4

8:05 – 8:10 a.m.

Departure to Space Center Houston

9:00 – 10:30 a.m.

Private Tram Experience: visit three NASA sites

10:30 – 12:00 a.m.

Exhibits, Theatre

12:00 a.m. – 1:30 p.m.

Café and/or gift shop

1:30 p.m.

Meet at front entrance to depart for UH Hilton



Notes



Notes

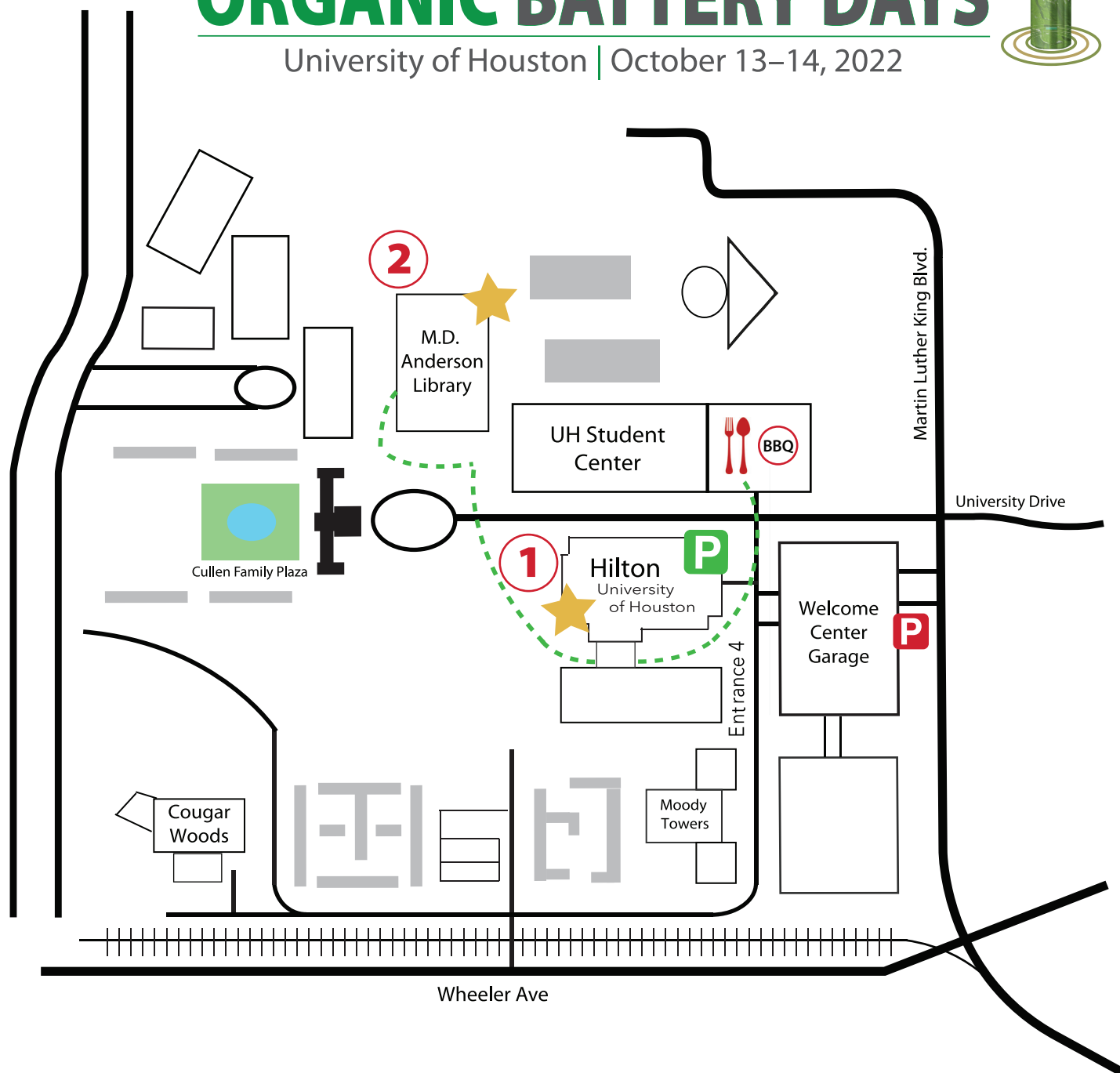


Notes



ORGANIC BATTERY DAYS

University of Houston | October 13–14, 2022



OCTOBER 12 - 14, 2022 EVENTS



① Hotel Registration (10/12) Breakfast Buffet (10/13–14) & Banquet (10/13)

Hilton University of Houston, Shamrock Ballroom
4450 University Drive, Houston, TX 77204



② Organic Battery Days – Meeting Location & Lunches (10/13–14)

MD Anderson Library, Elizabeth D. Rockwell Pavilion
2nd Floor – 4333 University Drive, Houston, TX 77204



Welcome BBQ

University Student Center (10/12)
2nd Floor – Ballroom

Parking Garages



Hilton Hotel Underground Parking
Entrance 4



UH Welcome Center Garage
4926 Calhoun Rd., Houston, TX 77004

Campus Maps: www.uh.edu/maps/

More Parking Information & Rates:
www.uh.edu/parking/parking-on-campus/visitor

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