IEEE ComSoc
IEEE Communications Society

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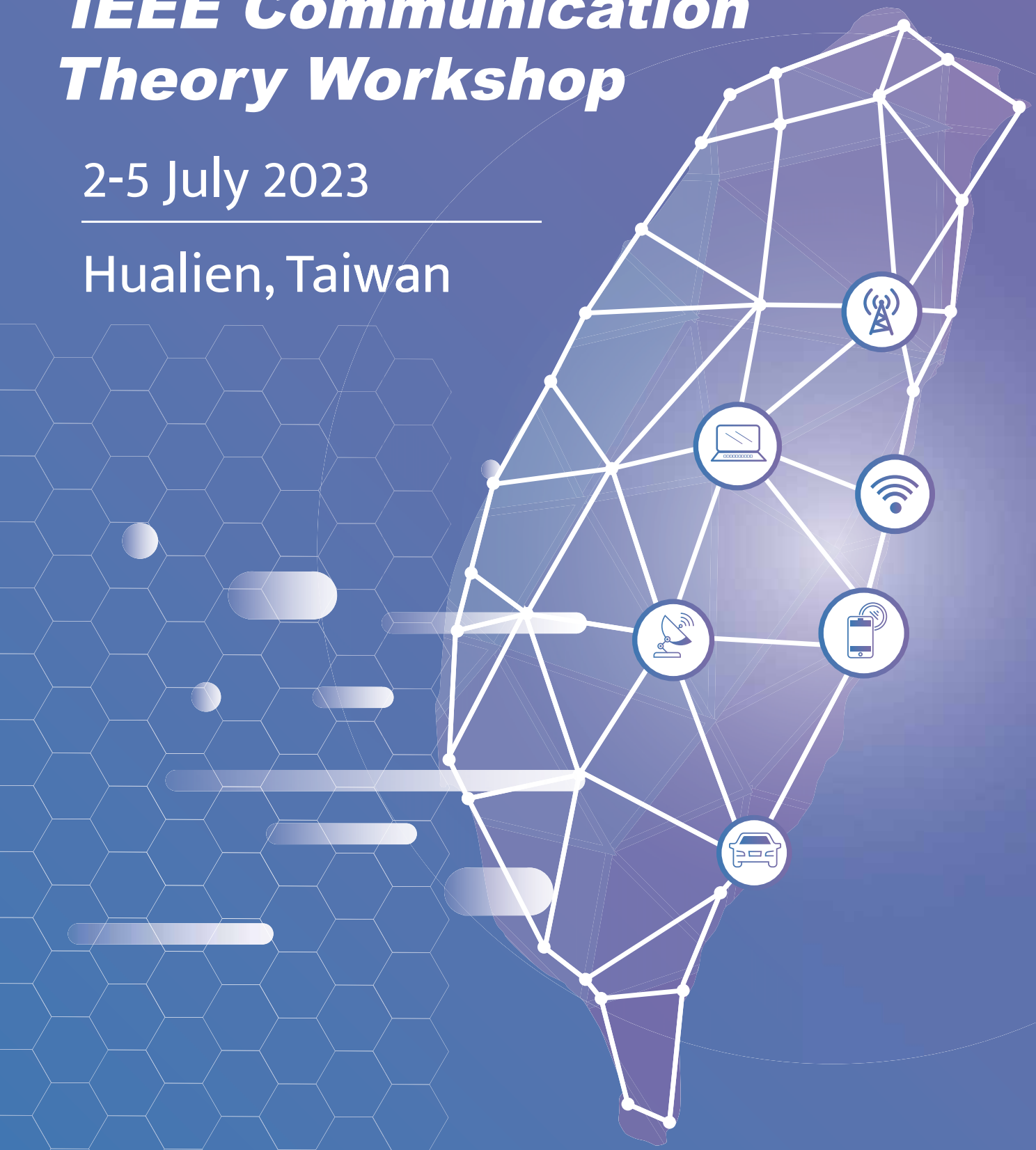
IEEE CTW 2023

IEEE Communication Theory Workshop

2-5 July 2023

Hualien, Taiwan



PROGRAM-AT-A-GLANCE

JULY 2 Sun.	JULY 3 Mon.	JULY 4 Tue.	JULY 5 Wed.
	Keynote 1 09:00-09:50	Keynote 2 09:00-09:50	Keynote 3 09:00-09:50
	Coffee break 09:50-10:20	Coffee break 09:50-10:20	Coffee break 09:50-10:20
	Session 1 10:20-12:00	Session 2 10:20-12:00	Session 4 10:20-12:00
	Lunch 12:00-13:30	Lunch 12:00-13:30	Closing remarks 12:00-12:15
CTW tour (Optional) 13:30-17:30	Award talks 13:30-14:45	Session 3 13:30-15:35	CTW tour (Optional) 13:30-17:30
	Coffee break 14:45-15:15	Coffee break 15:35-16:05	
	Panel 1 15:15-16:45	Panel 2 16:05-17:35	
	Poster session 16:45-18:15		
Welcome reception 19:00-21:00	Bus to night market (Lobby at 18:30)	Banquet 18:30-21:00	

CONFERENCE SCHEDULE

SUNDAY, JULY 2

13:30-17:30 (Optional) Tour to Taroko National Park 1F Lobby

19:00-21:00 Welcome Reception 1F Starry Lounge (Outdoor)

MONDAY, JULY 3 TECHNICAL SESSION 2F

09:00-09:50 Keynote - Changlong Xu
(Principal Engineer, Wireless R&D, Qualcomm)
Title: 6G – Standard, Requirements, and Technologies

09:50-10:20 Coffee Break

10:20-12:00 Session 1 - Machine Learning for Communications

Organizer: Jun Zhang (Hong Kong University of Science and Technology)

Speaker 1 and Early Achievement Award Talk: Walid Saad (Virginia Tech)
Title: Less Data, More Knowledge: Reasoning Foundations of Semantic Communication Networks

Speaker 2: Deniz Gunduz (Imperial College London)
Title: Semantic Communications with Generative Models

Speaker 3: Chia-Han Lee (National Yang Ming Chiao Tung University)
Title: End-to-End Deep Learning for Wireless Systems with Hardware Impairments

Speaker 4: Angela Zhang (Chinese University of Hong Kong)
Title: Task-Oriented Communication via Maximal Coding Rate Reduction

12:00-13:30 Lunch 1F Garden Court

13:30-14:45 Early Achievement Award Talks

Speaker 1: Nicolò Michelusi (Arizona State University)
Title: Decentralized Federated Learning via Non-Coherent Over-the-Air Consensus

Speaker 2: Harpreet S. Dhillon (Virginia Tech)
Title: Fundamentals of Landmark-Based Geolocation

Goldsmith Young Scholars Award Talk

Speaker: Ian Roberts (University of Texas at Austin)
Title: Full-Duplex Millimeter Wave Communication Systems

14:45-15:15 Coffee Break

15:15-16:45 Panel 1 - The Role of Information Theory in 6G

Moderator: Elza Erkip (New York University)

Panelist: Erik G. Larsson (Linköping University)

Panelist: Antonia M. Tulino (Università degli Studi di Napoli Federico II)

Panelist: Jinfeng Du (Nokia Bell-Labs)

Panelist: Daniela Tuninetti (University of Illinois Chicago)

16:45-18:15 Poster Session 2F Hallway

Organizers: Derrick Wing Kwan Ng (University of New South Wales) and Jemin Lee (Sungkyunkwan University)

18:30 Bus to Night Market 1F Lobby

TUESDAY, JULY 4 TECHNICAL SESSION 2F

09:00-09:50 Keynote - Giuseppe Caire (Technische Universität Berlin)

Title: Integrated Sensing and Communication Toolbox: Information Theory, Communication Theory, and Machine Learning

09:50-10:20 Coffee Break

10:20-12:00 Session 2 - Electromagnetics and Wireless Communications

Organizer: Erik G. Larsson (Linköping University)

Speaker 1: Massimo Franceschetti (University of California, San Diego)

Title: (Towards) Electromagnetic Information Theory

Speaker 2: Luca Sanguinetti (Pisa University)

Title: MIMO Communications with Physically Consistent Models

Speaker 3: Bruno Clerckx (Imperial College London)

Title: Reconfigurable Intelligent Surfaces 2.0: Beyond Diagonal Phase Shift Matrices

Speaker 4: Kai Kit Wong (University College London)

Title: On the Merits of Fluid Antenna Multiple Access: A Han-Kobayashi Perspective

12:00-13:30 Lunch 1F Garden Court

13:30-15:35 Session 3 - Massive, Grant-Free and Unsourced Random Access in Wireless Networks

Organizer: Giuseppe Caire (Technische Universität Berlin)

Speaker 1: Maxime Guillaud (INRIA)

Title: Multilinear Spreading for Massive Random Access

Speaker 2: Wei Yu (University of Toronto)

Title: Capacity of Downlink Massive Random Access

Speaker 3: Jean-Francois Chamberland (Texas A&M University)

Title: Applications of Sparse Regression LDPC Codes

Speaker 4: Alexander Fengler (Massachusetts Institute of Technology)

Title: Code Design for Asynchronous Unsourced Multiple-Access

Speaker 5: Giuseppe Caire (Technische Universität Berlin)

Title: A New "Composite" AMP Algorithm, Exact State Evolution Analysis, and Application to uRA/Initial Access in Cell-Free Massive MIMO Networks

15:35-16:05 Coffee Break

16:05-17:35 Panel 2 - 6G Technologies: What, Why, and How?

Moderator: Li-Chun Wang (National Yang Ming Chiao Tung University)

Panelist: Geoffrey Li (Imperial College London)

Panelist: Ashutosh Sabharwal (Rice University)

Panelist: I-Kang Fu (MediaTek)

Panelist: Reinaldo Valenzuela (Nokia Bell-Labs)

18:30-21:00 Banquet at Hotel

WEDNESDAY, JULY 5 TECHNICAL SESSION 2F

09:00-09:50 Keynote - Wen Tong (CTO, Huawei Wireless)

Title: Fast-Slow Machine and Human Modeling for GPT

09:50-10:20 Coffee Break

10:20-12:00 Session 4 - Integrated Sensing and Communications

Organizer: Jinhong Yuan (University of New South Wales)

Speaker 1: Sundeep Rangan (New York University)

Title: Millimeter Wave Sensing for Robot Navigation: Closing the Loop

Speaker 2: Babak Hassibi (California Institute of Technology)

Title: Occam's Radar: Atomic Norms and Modulating on Conjugate Zeros

Speaker 3: Tsung-Hui Chang (Chinese University of Hong Kong – Shenzhen)

Title: Information and Sensing Beamforming Optimization for Multi-User Multi-Target MIMO ISAC Systems

Speaker 4: Jinhong Yuan (University of New South Wales)

Title: Delay-Doppler Multicarrier Modulation: A Promising Signal Waveform for ISAC

12:00-12:15 Closing Remarks

13:30-17:30 (Optional) Tour to Taroko National Park 1F Lobby

POSTER SESSION

2F HALLWAY

Topic: Reconfigurable Intelligent Surface

1 Does a Large Reconfigurable Intelligent Surface Eliminate Channel Correlation?
Kuang-Hao (Stanley) Liu

2 Stochastic Reformulation for Discrete Optimization: RIS-aided Communication System Insights
Anish Pradhan and Harpreet S. Dhillon

3 Intelligent Reflecting Surface Aided Generalized Spatial Modulation Millimeter-wave Massive MIMO System
Chia-Chang Hu and Tsung-Hsin Hsu

4 Quantifying the Available Geometric Information in Signals Reflected by RIS
Don-Roberts Emenonye, Harpreet S. Dhillon, and R. Michael Buehrer

5 LSTM-based Precoding for RIS-assisted MIMO Systems with Implicit CSI
Po-Heng Chou, Jiun-Jia Wu, Chin-Tang Chen, Wan-Jen Huang, Yu Tsao, and Ronald Y. Chang

Topic: Massive MIMO and Connectivity

6 Bayesian Activity Detection for Massive Connectivity in Cell-free IoT Networks
Hao Zhang, Qingfeng Lin, Yang Li, Lei Cheng, and Yik-Chung Wu

7 Sub-band Precoding for Massive MIMO-OFDM Systems
Kelvin Kuang-Chi Lee and Chiao-En Chen

8 Completely-blind Efficient Receiver for Asynchronous Massive Grant-Free NOMA
Takanori Hara and Koji Ishibashi

9 Practical Grant-free NOMA Based on Low-density Structured OFDM
Kohei Ueda, Takanori Hara, and Koji Ishibashi

10 Semantic Queries for Massive IoT
Anders E. Kalør, Kaibin Huang, and Petar Popovski

Topic: Antenna and Receivers

11 Low Complexity MRC Detector for Oversampling OTFS Receiver
Preety Priya, Emanuele Viterbo, and Yi Hong

12 Physical Beam Sharing Systems and Over-the-air Measurements
Yan-Yin He, Hsiao-Chien (Angie) Chen, and Shang-Ho (Lawrence) Tsai

13 Satellite Communications with Hybrid Array Architecture for Beam Squint Compensation
Heedong Do, Namyoon Lee, Robert W. Heath Jr., and Angel Lozano

14 Dual Function Radar Communication and Screaming Channels: a Pre-study
Maria De Lauretis, Elena Haller, and Mark Dougherty

Topic: Localization

Topic: Coding

Topic: Communication Theory

Topic: AI-driven Communications

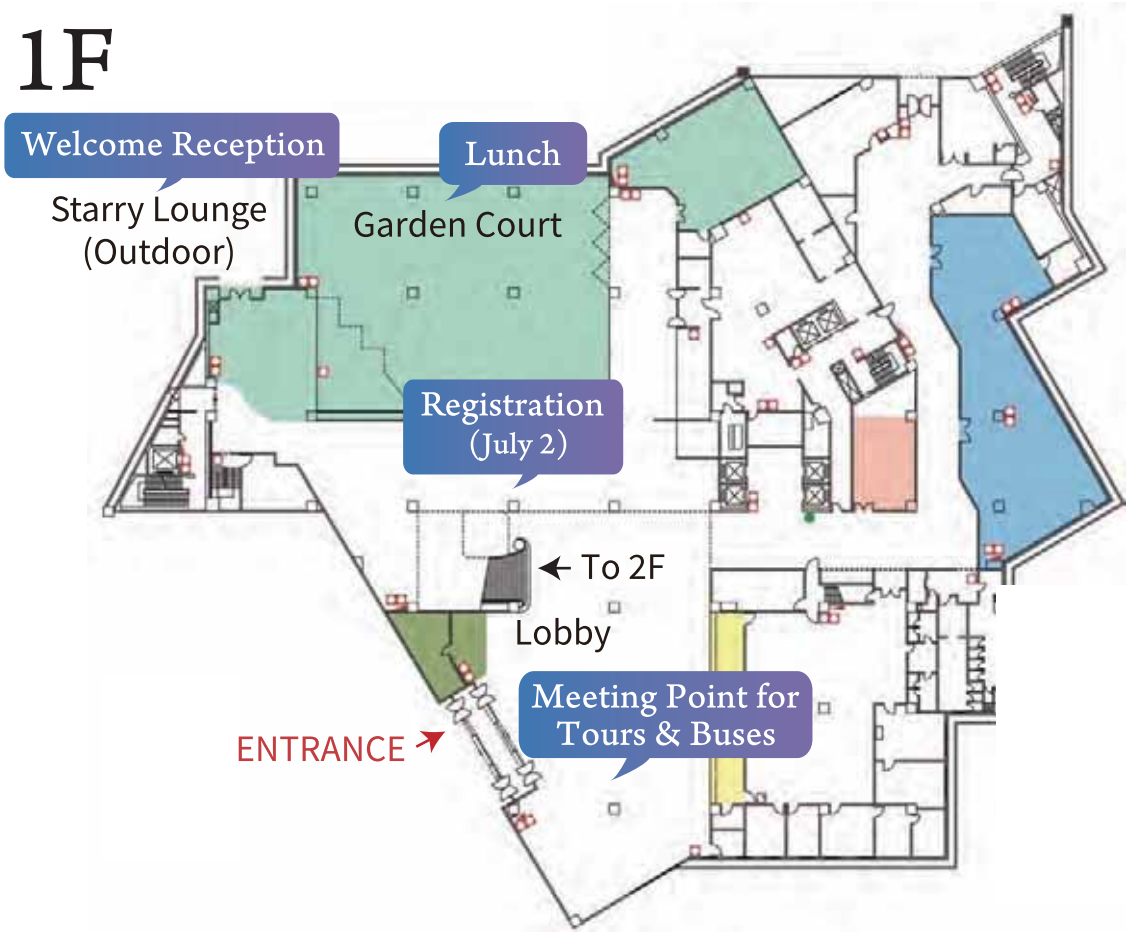
Topic: Emerging Networks

Topic: Networking

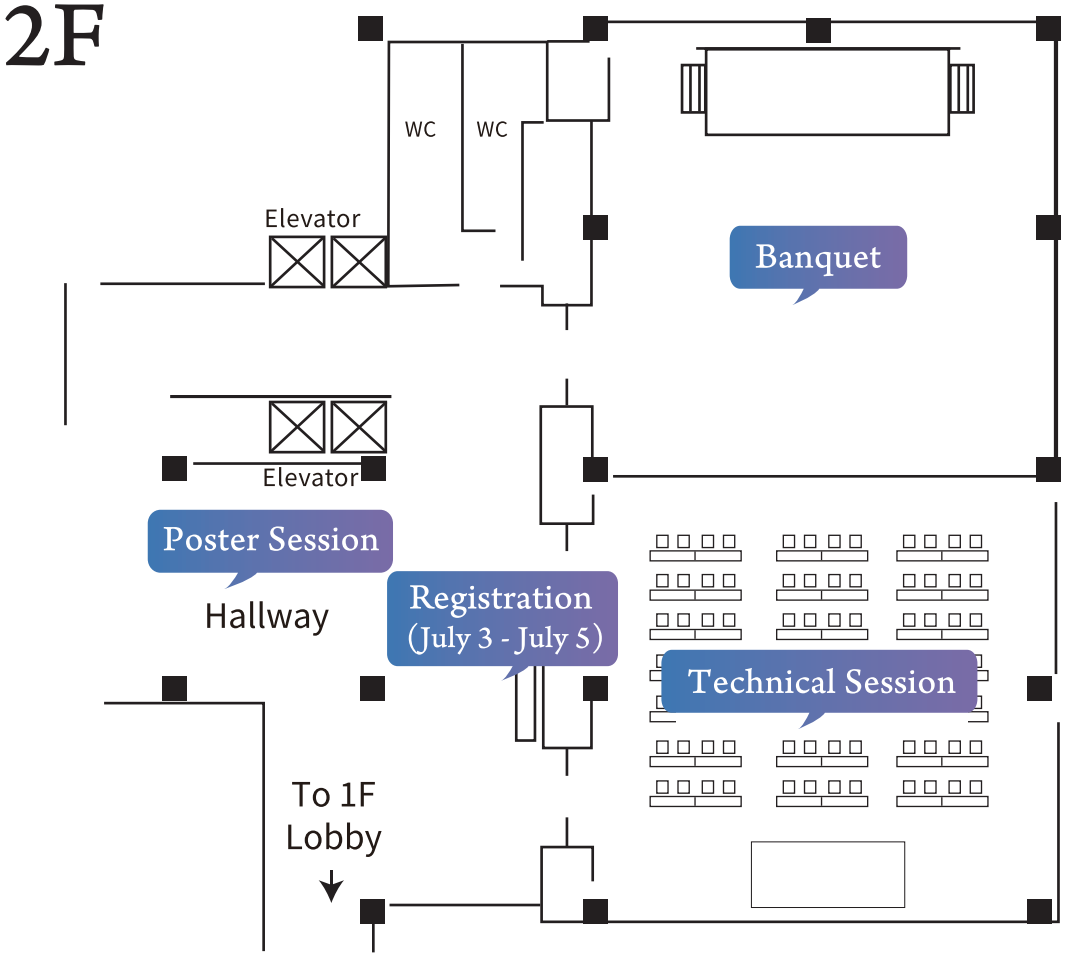
Topic: Surveillance

FLOOR MAP

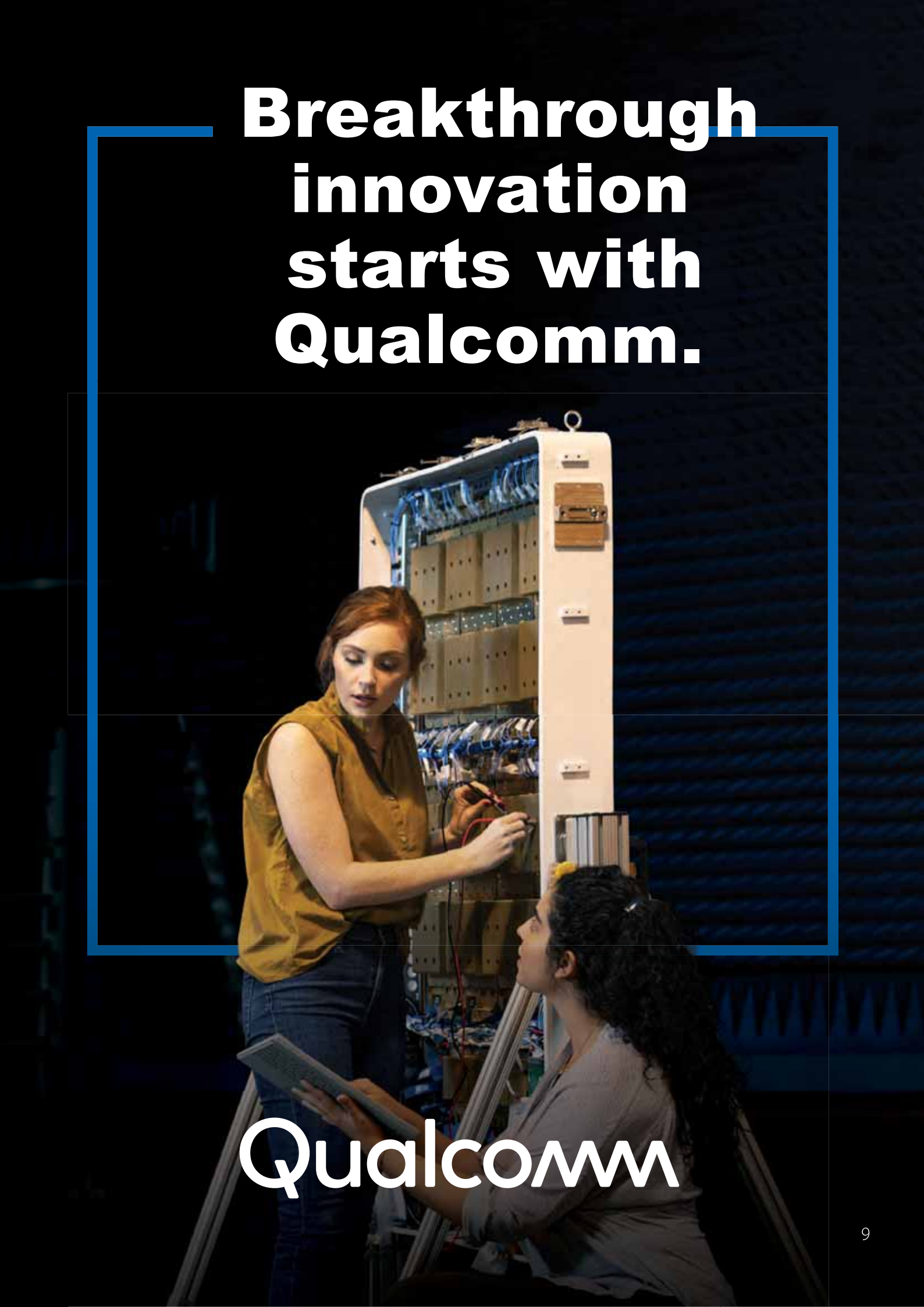
1F



2F



Breakthrough innovation starts with Qualcomm.



Qualcomm

Founded in 1987, Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. We have 207,000 employees and operate in over 170 countries and regions, serving morethan three billion people around the world. We are committed to bringing digitalto every person, home and organization for a fully connected, intelligent world.

Scientific exploration and technological innovation drive civilization and society forward. Huawei understands the importance of research and innovation and how openness is critical for both. We are ready and willing to work with academia and industry to explore the frontiers of science and technology, push innovation forward, create value for industry and society as a whole, and build a better intelligent world.

We entered into a golden age of 5G applications with industry producing over 20,000 use cases. Huawei created the GUIDE business blueprint and "Lighting up the 5.5G Era" initiative to support this boom in applications. We developed more than 100 scenario-based solutions and multiple business units to focus on specific industries, including the Mine BU, Smart Road, Waterway & Port BU, Government Public Services Digitalization BU, Electric Power Digitalization BU, Digital Finance BU, and Aviation & Rail BU. We launched HarmonyOS 3, significantly expanding Super Device capabilities. Huawei Cloud was deployed in 29 Regions around the world, and is becoming the preferred choice of customers in industries such as finance and manufacturing to migrate to the cloud. Huawei Digital Power helped customers generate 695.1 billion kWh of green power and save 19.5 billion kWh of electricity. These efforts have offset 340 million tons of CO2 emissions, which is equivalent to planting 470 million trees. The Kunpeng and Ascend ecosystems were joined by more than 5,200 partners and 3.1 million developers and offered more than 14,000 certified solutions. Huawei officially launched the Chaspark Technology Website, which has attracted more than 120,000 authenticated users from across multiple academic fields.The platform presents technical challenges to the public, allowing experts from outside Huawei to propose their own solutions. Huawei's TECH4ALL education projects benefited over 600 schools and more than 220,000 people, including K–12 students and teachers, unemployed youths, and senior citizens. Huawei joined ITU's Partner2Connect digital alliance, promising to connect 120 million people in remote areas across more than 80 countries by 2025.

COMMITTEE

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