

# RIS Prototyping and ORAN-RIS Integration

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# RIS Prototyping and ORAN-RIS Integration

- Introduction of National Chung Cheng University
- Developing various RIS prototypes
- RIS RF Modeling
- ORAN-RIS Integration
- Open for Collaborations



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# National Chung Cheng University



**Faculty: 755**

**Students: 6300(U)/5300(G)**

**Colleges: 7**

**Research Centers: 17**

**Established: 1989**

## RIS Research Group

✓ **10 Professors**

✓ **Collaboration partners:**



**工業技術研究院**

Industrial Technology  
Research Institute



財團法人資訊工業策進會  
INSTITUTE FOR INFORMATION INDUSTRY



**ASE GROUP**  
**日月光集團**



**TMYTEK**

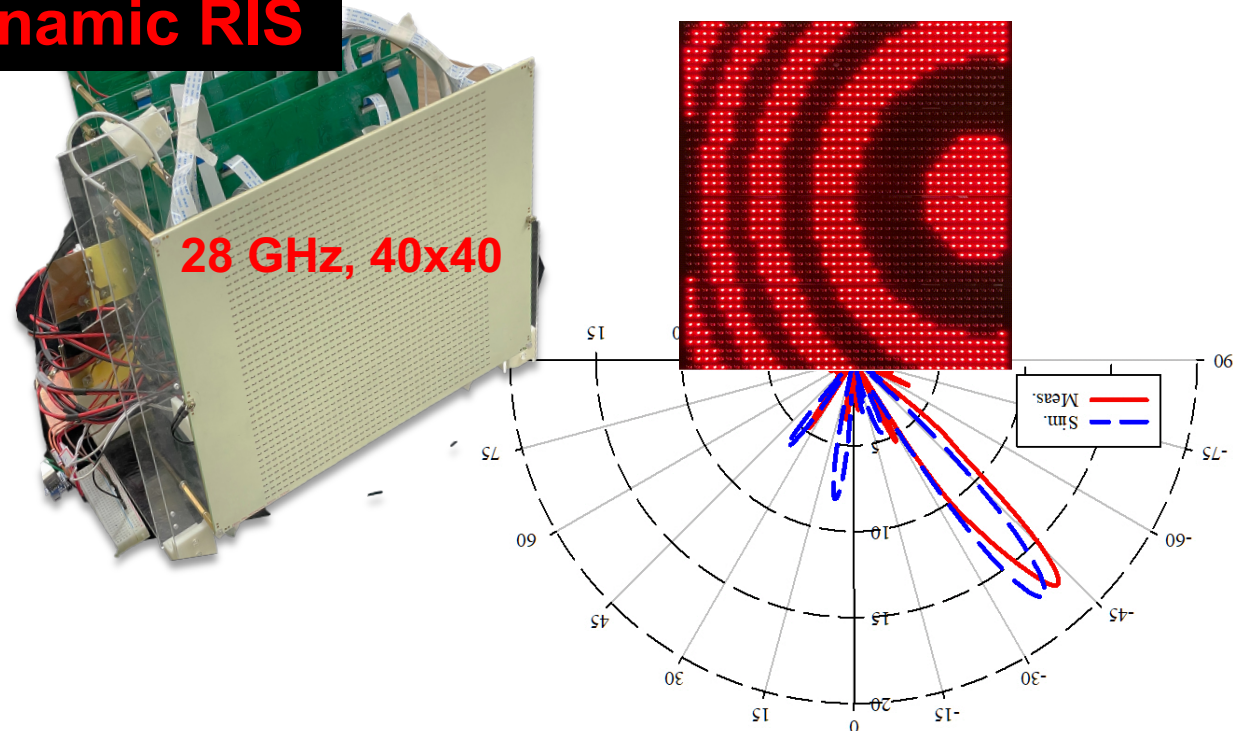
**MEDIA TEK**

**Unimicron**  
**欣興電子**

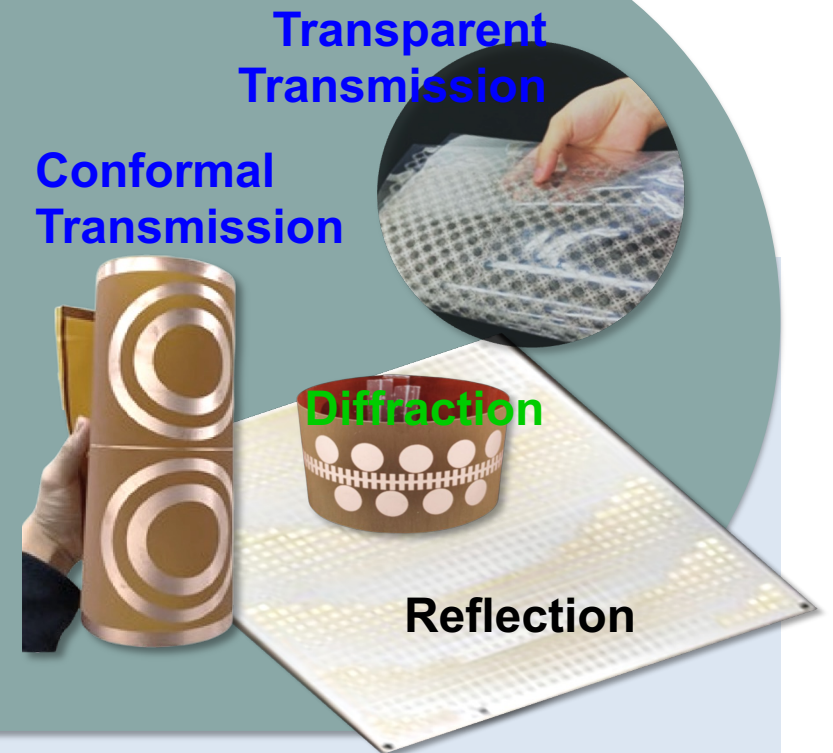
# Developed a series of RIS prototypes

- ✓ **Type:** Static RIS (zero power supply), **Dynamic RIS**
- ✓ **Functionality:** Reflection, **Transmission**, **Diffraction**, Absorption
- ✓ **Frequency band:** microwave to millimeter-wave bands
- ✓ **Panel size:** Small (100 elements) to Large (10,000 elements)
- ✓ **Substrate:** PCB, Transparent film
- ✓ **Sensing:** AoA, power level, polarization

## Dynamic RIS



## Static RIS

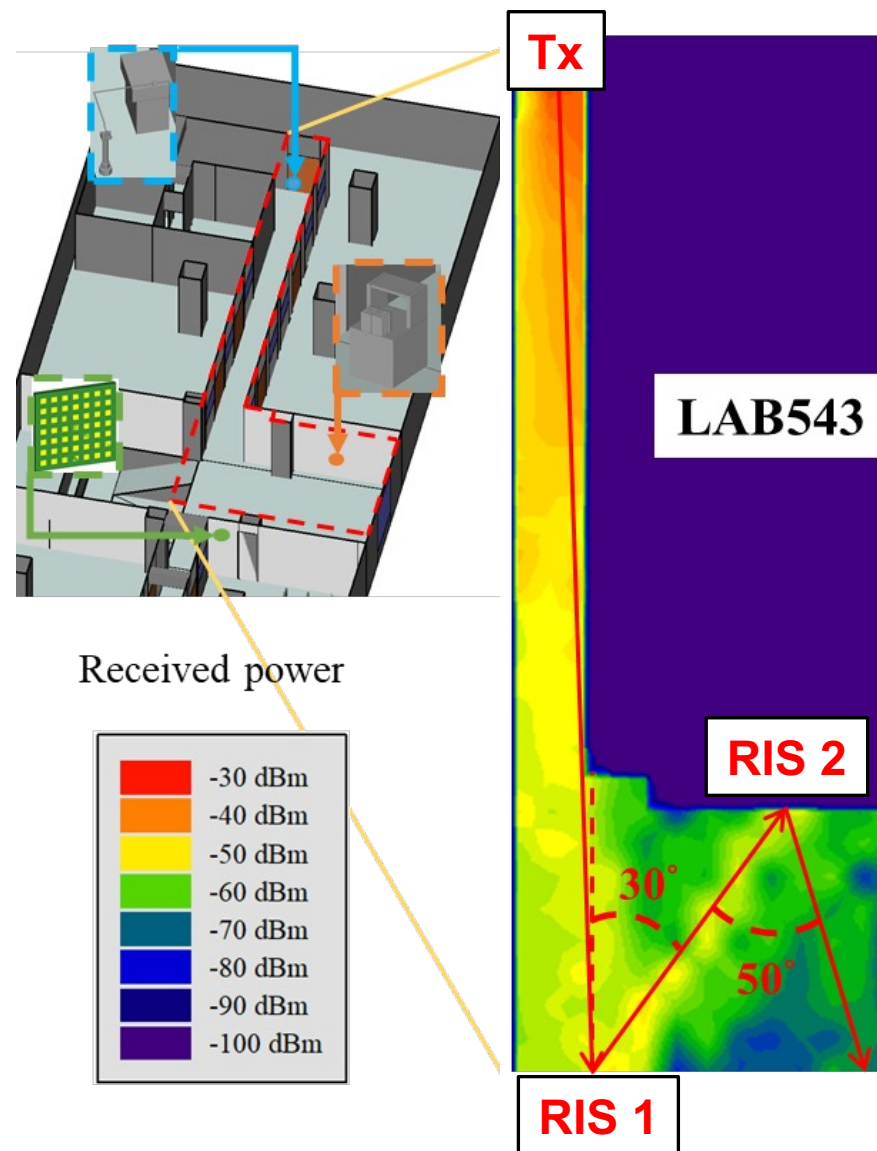
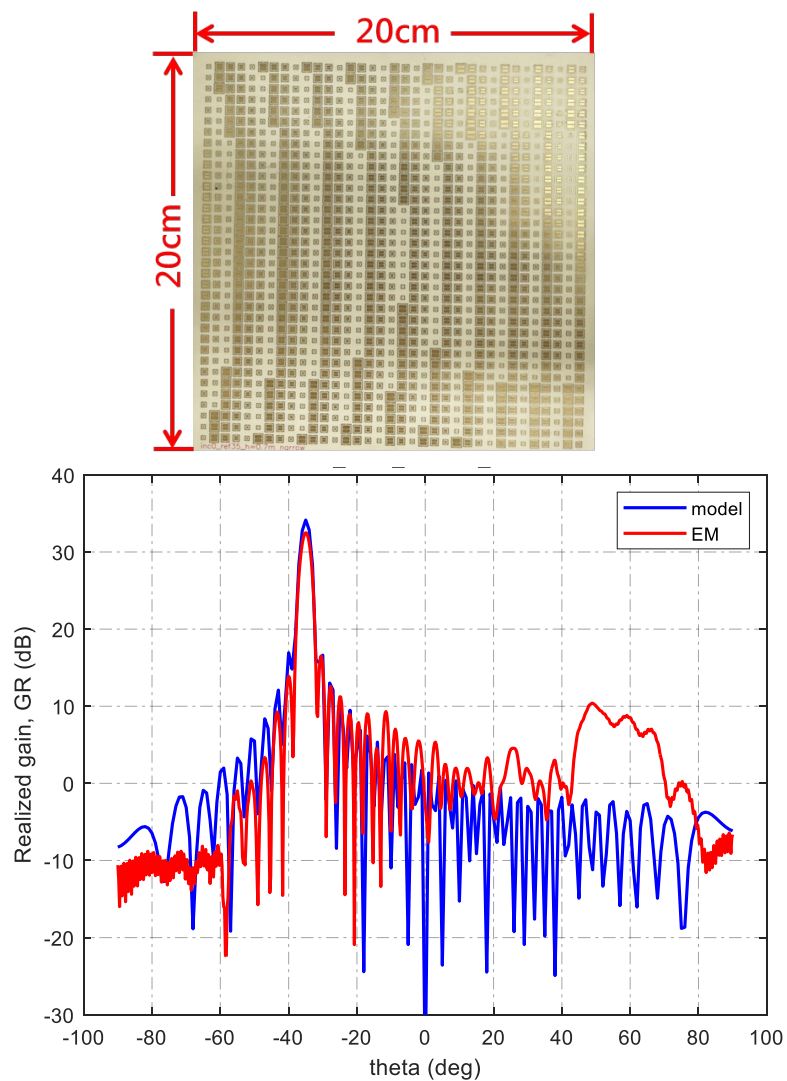


Collaborate with TMYTEK



# RIS RF Modeling

Established an RIS RF model for system design and ray-tracing simulation.



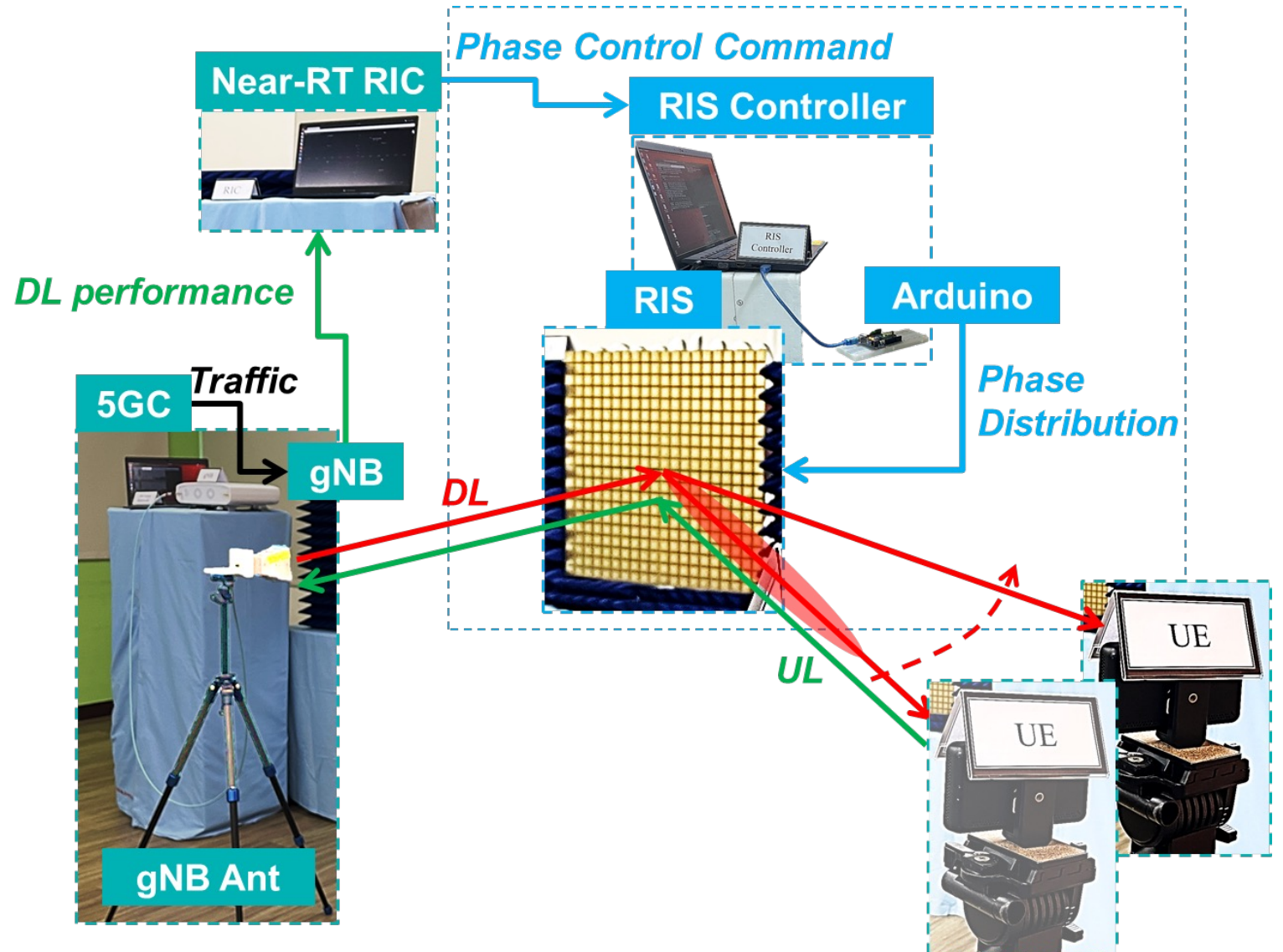
# O-RAN RIS Integration

## The RIS O-RAN Supports

- The O-RAN standard interface (E2)
- The 3GPP standard interface (UI)

## The RIS O-RAN Integrates

- The O-RAN platform
- The core network
- 5G gNB and mobile terminals
- The Near-RT RIC



# Open for Collaborations

## ■ RIS Advancement

- ✓ **MMW/Terahertz**
- ✓ **Optical-control**
- ✓ **LC/Green Substrate**
- ✓ **Sensing**

## ■ Network Controlled/Assisted RIS

## ■ O-RAN RIS Integration

## ■ JCAS for Localization, Positioning, Sensing

## ■ RIS-assisted Non-terrestrial Communications