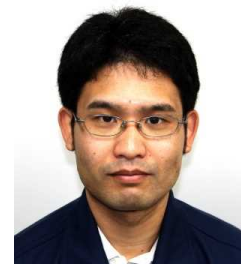


# Computer Network and Security



**Name** Yasutoshi Arata **E-mail** arata@okinawa-ct.ac.jp

**Status** Technical Staff

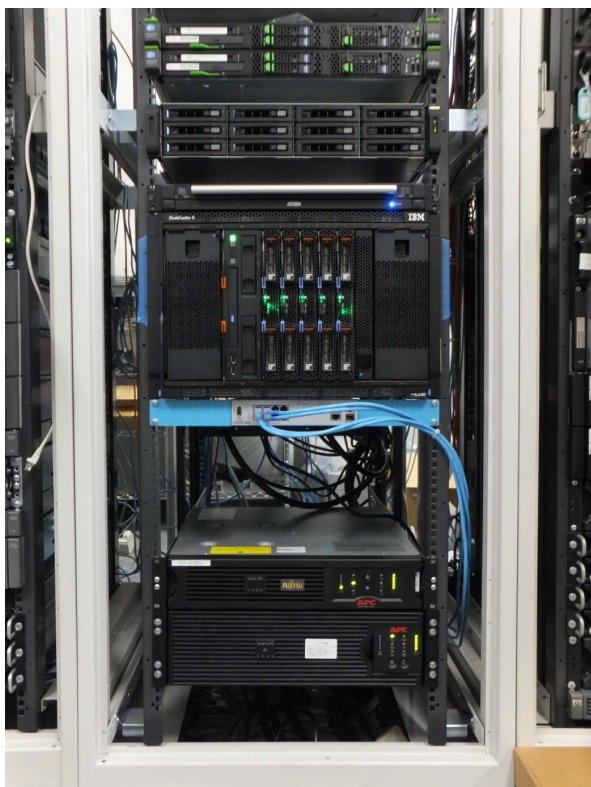
**Affiliations**

**Keywords** Information processing, computer network

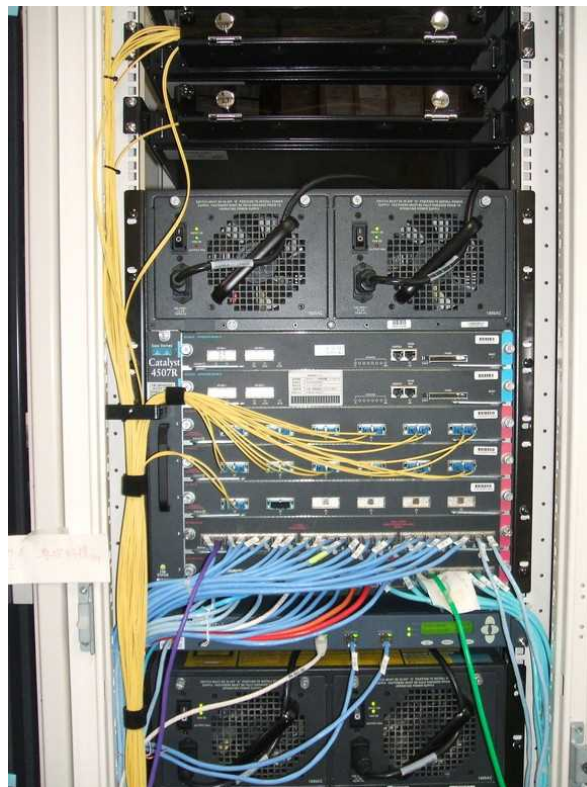
**Technical Support Skills**

- Network construction
- Windows Products Activation
- Server Virtualization

## Research Contents



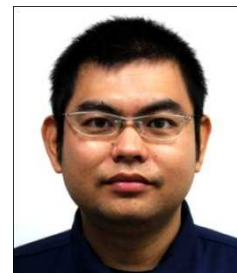
Virtual Server



Main Switch

## Available Facilities and Equipment

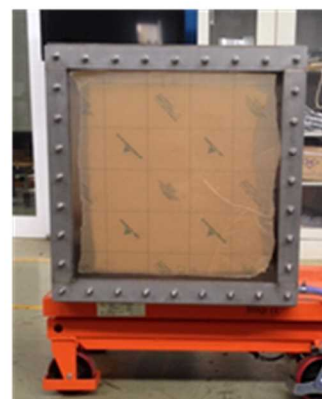
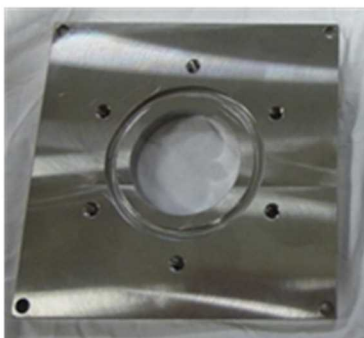
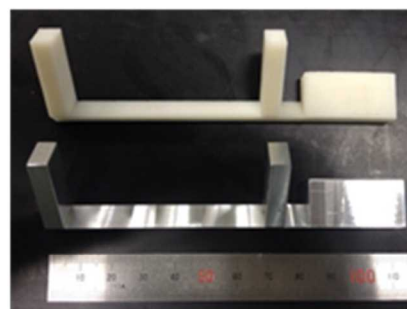
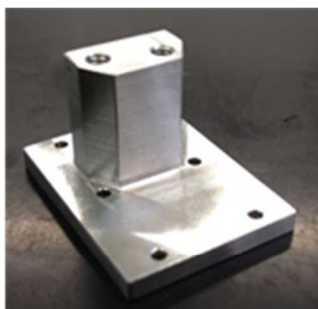
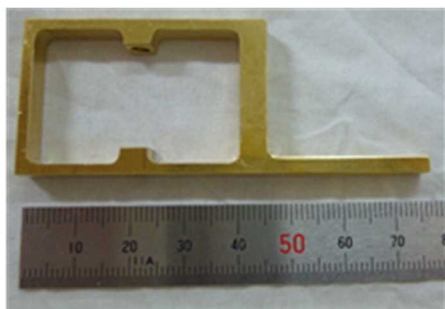

## Making the parts using the CNC Machine



Name	Yukimasa Omine	E-mail	omine@okinawa-ct.ac.jp
Status	Technical Staff		
Affiliations			
Keywords	CNC Machining , CAD , CAM		
Technical Support Skills	<ul style="list-style-type: none"> <li>Machine work</li> <li>CAD and CAM</li> </ul>		

### Research Contents

#### Trial manufacture



### Available Facilities and Equipment

CNC Milling (MAKINO KE-55)	
Machining center (MAZAK VARIAXIS 500-5X)	
CNC Turning (DMG MORI NL2500)	

# Generation of Underwater Shock Wave using High voltage electrical discharge

**Name** Osamu Higa **E-mail** osamu@okinawa-ct.ac.jp

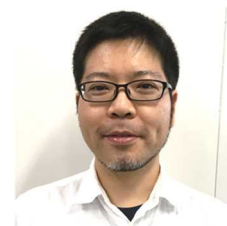
**Status** Ph. D.

**Affiliations** IEEJ (The Institute of Electrical Engineers of Japan)

**Keywords** Electric discharge, Underwater shock wave, Pulse power, Food processing

**Technical Support Skills**

- Application of instantaneous high pressure by underwater shock wave
- Design and trial production of high voltage circuit
- Visualization of fluid using high-speed camera



## Research Contents Generation of underwater shock waves using high voltage electrical discharge and its application

- We are researching applications of underwater shock wave generated by high-voltage underwater discharges to agriculture, forestry, and fishery resources.
- We are researching discharge characteristics generated shock waves effectively and applied it to the development of shock wave devices.

### We are developing generation techniques of shock wave by electric discharge (Fig 1).

- ✓ Generated the shock wave by spark discharge and wire explosion on underwater electrode
- ✓ The faster the expansion of electric discharge or wire explosion, the stronger the shock wave that can be generated.

### We are measuring and evaluating the discharge characteristic and propagation of the shockwave.

- ✓ Measure discharge characteristics and shock wave intensity and feedback to equipment development (Fig. 2)
  - ✓ Shock wave phenomenon is evaluated by visualizing using a high-speed camera (Fig. 3)
- ⇒ Instantaneous high power and high pressure can be used

### We are researching for practical application of instantaneous high-pressure to agriculture, forestry, and fishery resources.

- ✓ Can be expected to processing effects that cannot be obtained with standard methods
  - ✓ Researched application to various objects
1. Spall processing of lacquer tree for raw lacquer extraction
  2. Processing to YUZU citrus to improve extraction of aroma oils (Fig. 4)
  3. Leaf milling for essential oil extraction
  4. Crush processing of rice with non-heating

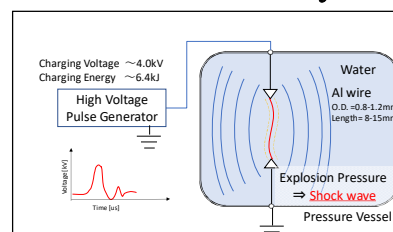


Fig.1 Generate of shock wave using electric discharge

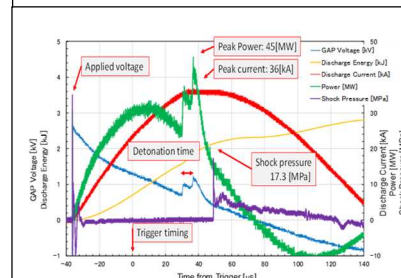


Fig.2 Discharge waveform and pressure



Fig. 4 Processing device for YUZU citrus

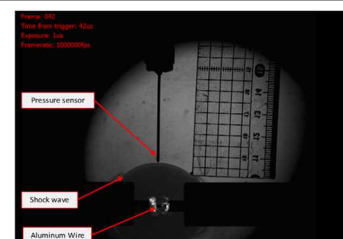


Fig. 3 Visualization of underwater shock waves

## Available Facilities and Equipment

Portable Shock wave generator (1J, 30kV, 10pulse/sec, Self-developed)	High speed video camera Kirana 5M (5Mfps)
Marx type shock wave generator ( 4.9kJ, 14kV, 12pulse/min, Self-developed)	Optical system (Self-developed)
Capacitors bank type shock wave generator (4.9kJ, 3.5kV, 12pulse/min, Self-developed)	Underwater Shock pressure sensor, Measuring instrument for high voltage and high current



# Island biology : Evolutionary Biology and Ecology of Plant Mutualisms



**Name** Kenta WATANABE **E-mail** kenta-w@okinawa-ct.ac.jp

**Status** Ph. D.

**Affiliations** The Society for the Study of Species Biology, Ecological society of Japan,

**Keywords** Island Biology, Evolutionary Ecology, Reproductive Biology, Environmental Education, genus *Psychotria*, Heterostyly

**Technical Support Skills**   
• Biodiversity analysis, Environmental education, Plant identification  
• Plant documentation such as "Scanography"

## Research Contents Island Biology, Conservation and Environmental Education

**Key topics and central questions:**

### 1. Evolutionary ecology of the plant breeding systems and pollination biology on islands

Why is distyly so adaptive? Why is the proportion of dioecism so high on islands compared to continents? Is breakdown of heterostyly evolutionary dead end? <by using the genus *Psychotria* (Rubiaceae) as a model system>

### 2. Plant adaptations to problematic soils; Plant-Fungi symbiosis; Reproductive interference and habitat isolation

What caused the different plant species composition between limestone and non-limestone forests in the Ryukyu Islands?

### 3. Seed dispersal mutualisms on islands

Who are the essential seed dispersal agents in the Ryukyu and Bonin Islands?

### 4. Metadata analysis of island biota

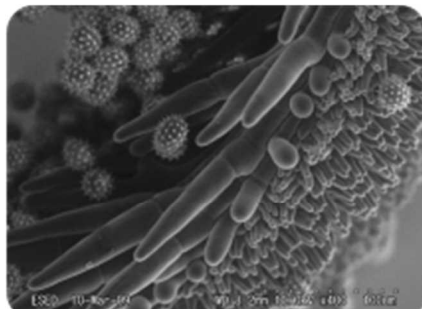
Can we use the Japanese Islands as a model system for "Island Biology"?

### 5. Conservation biology of the marine systems in the Ryukyu islands and environmental education

What can we learn from a local marine system (Oura Bay)?

### 6. Floral scent analysis and genetic diversity

How floral scent differs between individual plants, and what does it mean ecologically?



## Available Facilities and Equipment

Scanning electron microscopy (SEM)

Fluorescence microscopy

# Study of the heat resistance

Name Kenta Gibo E-mail gibo@okinawa-ct.ac.jp

Status Technical Staff

Affiliations

Keywords Thermal analysis of the heat-resistant material, Numerical simulation

Technical Support Skills Thermal design of heat-resistant material



## Research Contents

### Numerical simulation of thermal response of the heat-resistant material

Re-entry capsule to bring back equipment to Earth from a space is exposed to severe heating environment by aerodynamic heating during re-entry. CFRP ablator are used as thermal protection materials to protect against high heat environment inside the capsule. In order to design the ablator, it is necessary to predict the thermal behavior. This thermal analysis technology is effective not only for the special environment of the atmospheric re-entry, but also in the design of heat-resistant material in general.

Table1 Test conditions

Heat condition	
Heating rate : $q_{cw}$	$0.98\text{MW/m}^2$
Heating time : $T_h$	60s
Test model	
Diameter : $d$	34mm
Length of ablator : $t_1$	20mm
Length of insulation : $t_2$	20mm

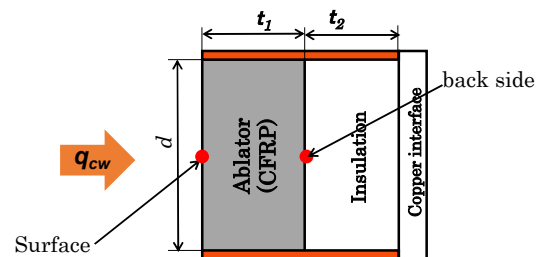
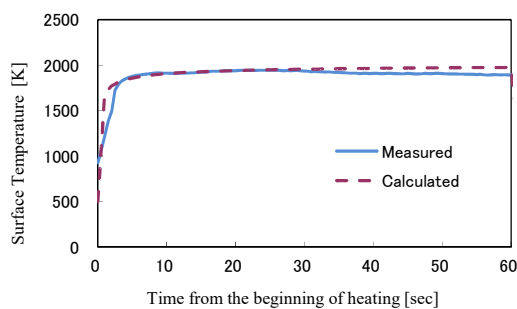
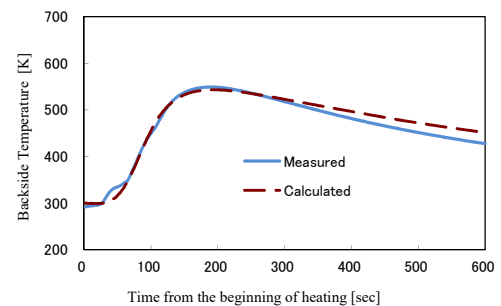


Fig.1 Outline drawing of test model



(a) Comparison of surface temperature



(b) Comparison of back side temperature

Fig.2 The comparison between the measured and calculated values

## Available Facilities and Equipment


研究タイトル:

## 落雷学習教材の開発

氏名: 白石博伸 / SHIRAISHI Hironobu E-mail: h-shira@okinawa-ct.ac.jp

職名: 技術職員 学位: 学士(理学)

所属学会・協会:

キーワード: 電気回路、電子回路、高電圧、教材開発

技術相談

提供可能技術:

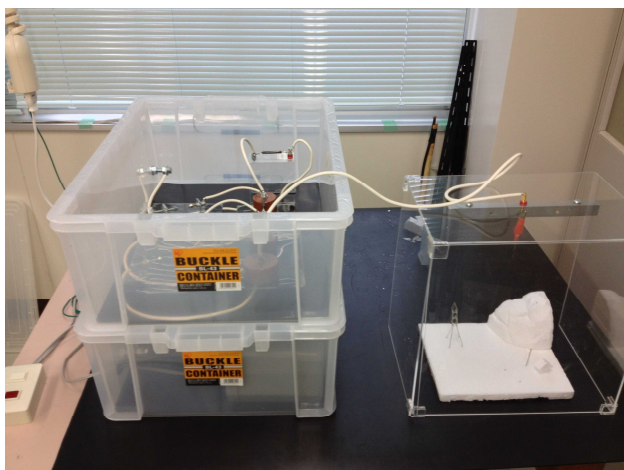
- ・電気, 電子回路
- ・教材開発



### 研究内容:

雷の発生とその性質を学ぶ教材の開発

落雷から身を守るための対策を解説する教材開発



落雷デモ装置



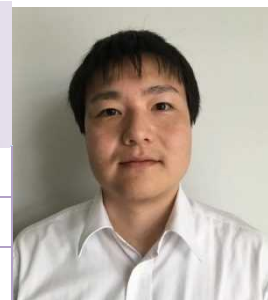
落雷のデモンストレーション

### 提供可能な設備・機器:

名称・型番(メーカー)




## Development of learning materials on lightning



**Name** Hironobu SHIRAISHI **E-mail** h-shira@okinawa-ct.ac.jp

**Status** Technical Staff

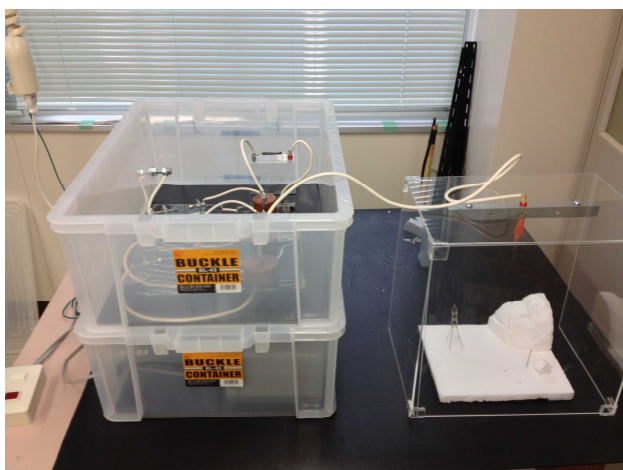
**Affiliations**

**Keywords** Electric circuit, High voltage, Development of Teaching Materials

**Technical Support Skills**

- Electric circuit
- Development of Learning Materials

### Research Contents



Lightning Generator



Demonstration of lightning strike

### Available Facilities and Equipment
