

# SATU

## Presidents' Forum

of Southeast and South Asia and Taiwan Universities  
台灣與東南亞暨南亞大學校長論壇

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## 2016 SATU Joint Research Scheme Program

### Host Application Form

Date: 2016 / 04 / 21 (year / month / day)

#### 1. Host University

National Taipei University of Technology

#### 2. Host Unit

Department of Electro-Optical Engineering

#### 3. Joint Research Project Title

Optical microcavity resonators

#### 4. Principal Investigator

Passport Name	Tzyy-Jiann Wang		
Nationality	Taiwan	Gender	<input checked="" type="checkbox"/> M <input type="checkbox"/> F
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#### 5. Co- PI from the same unit – If any

Passport Name			
Nationality		Gender	<input type="checkbox"/> M <input type="checkbox"/> F
Address			
Telephone	(Office)	(Home / Mobile)	
Fax Number		E-mail	

#### 6. Project Details

Project Description	Optical microcavity resonators can confine lightwave in a small volume with a prolonged storage time. The performance of photonic devices using microcavity resonators, such as microlaser, biosensor, nonlinear optic device, and wavelength add-drop multiplexers, can be effectively enhanced by the buildup of high intensity and lengthening lightwave/material interaction time. Optical
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microresonators have the forms of micropost, microring, microdisk, microtoroid, microsphere, and photonic crystal cavity. In this project, we produce microdisks, microtoroids, and microspheres using different materials, such as silica, Er-doped silica,  $\text{Er}_2\text{O}_3$ , and  $\text{LiNbO}_3$ . These materials have peculiar properties. Silica has high purity and is a good material to produce passive devices, such as biosensors and wavelength division multiplexing (WDM) devices. Er-doped silica and  $\text{Er}_2\text{O}_3$  have optical gain and can be used to produce microlaser.  $\text{LiNbO}_3$  possesses excellent physical properties, such as electro-optic effect, nonlinear-optic effect, photoelastic effect, and piezoelectric effect. Versatile functions, such as electro-optic modulation and second harmonic generation, can be implemented on the  $\text{LiNbO}_3$  devices. The wide applications of optical microcavity resonators in different devices not only enhance the device performance but also create new device functions.

## 7. Acknowledgement (Signed by the President or SATU representative to show recognition)

Name *Chaochin Su*  
title *Dean of R&D Center*



(signature)

Date: *2016 / 04 / 27* (yyyy/mm/dd)

Please email [satu@email.ncku.edu.tw](mailto:satu@email.ncku.edu.tw) before 2016.4. 29(Fri.) for application with the subject line: <2016 SATU JRS host application –School Name>. Thank you.