

# 可積系統與正交多項式研討會

## Workshop on Integrable Systems and Orthogonal Polynomials

時 間： 106 年 6 月 23 日（星期五）下午 2:00~5:30

地 點： 國立中山大學理學院四樓理 SC4009-1 室

時間/講員/講題：

2:00-2:50 Mourad Ismail (University of Central Florida and King Saud University)  
Applications of special functions

3:10-3:50 Chuan-Tsung Chan 詹傳宗 (Tunghai University)  
Singularity confinement and the periodic nonlinear difference equations

3:50-4:30 Hsiao-Fan Liu 劉筱凡 (Academia Sinica )  
q-Generalizations of the Laguerre and Hermite orthogonal polynomials

4:50-5:30 Ting-Jung Kuo 郭庭榕 (National Taiwan Normal University)  
Some smoothness results of Painleve VI equation

主辦單位： 國立中山大學應用數學系

贊助單位： 科技部數學研究推動中心  
國家理論科學研究中心



應用數學系



校園地圖



交通資訊

# Some applications of special functions

Mourad Ismail

University of Central Florida and King Saud University

I will discuss several problems from different areas of mathematics where the solution uses special functions in an essential way.

# Singularity Confinement and the Periodic Non-linear Difference Equations

Chuan-Tsung Chan (詹傳宗)

Department of Applied Physics, Tunghai University

A simple non-autonomous difference equation is selected from the QRT family based on the (local) singularity confinement test. The most general solutions of this equation are shown to be periodic. Hence this equation provides an explicit example where infinite recurrence of singularity can evade the (local) singularity confinement test.

# **q-Generalizations of the Laguerre and Hermite orthogonal polynomials**

Hsiao-Fan Liu (劉筱凡)

Institute of Mathematics, Academia Sinica

In this talk, we will discuss the explicit solutions of the recursive coefficients, matrix elements of generators for the Heisenberg algebra, and the corresponding Hankel determinants. The power of quadratic relation is illustrated by comparing two ways of calculating recursive coefficients. We derive a q-deformed version of the Toda equations for both q-Laguerre and Hermite ensembles, and check the compatibility with the quadratic relation.

# Some smoothness results of Painlevé VI equation

Ting-Jung Kuo (郭庭榕)

Department of Mathematics, National Taiwan Normal University

In this talk, we mainly study the smoothness of solutions to  $\text{PVI}(\frac{9}{8}, \frac{-1}{8}, \frac{1}{8}, \frac{3}{8})$ . The following issues would be covered in this talk:

- (i) An explicit formula to count the number of poles of an algebraic solution with the monodromy group of the associated linear ODE being  $D_N$ , where  $D_N$  is the dihedral group of order  $2N$ .
- (ii) Smoothness result for a class of solutions on the real axis.

This is a joint work with Z. Chen and C.S. Lin.