

# 中央研究院數學研究所

Institute of Mathematics, Academia Sinica

## Taipei Postdoc Seminar

**Speaker** : 彭俊文 Jun-Wen Peng

(University of Rochester)

**Title** : An Embedding of the Arboreal Galois Group for PCF Maps Equations

**Time** : 14:00 - 15:00, Wednesday, April 7, 2021

**Venue** : Lecture Hall 5F, Cosmology Building (NTU Campus) 次震宇宙館 五樓演講廳

**Abstract** :

Let  $f : \mathbb{P}_K^1 \rightarrow \mathbb{P}_K^1$  be a rational map defined over a field  $K$ , and let  $K_n$  be the splitting field of  $f^n(X) - \alpha = 0$  where  $f^n$  is the  $n$ -th iterate of  $f$ . We study the Galois group  $G_n = \text{Gal}(K_n/K)$ . Odoni has showed that, avoiding a finite subset of  $\mathbb{P}_K^1$ , the profinite group  $G_\infty = \varprojlim_n G_n$  acts on the infinite  $d$ -ary regular tree  $T_\infty$ , and hence we obtain a Galois representative, so called arboreal representative, by embedding  $G_\infty$  to the automorphism of the tree  $\text{Aut}(T_\infty)$ . Generically, this embedding is surjective. However when  $f$  is a post-critical-finite(PCF) map, Jones showed that the image of  $G_\infty$  is an infinite index subgroup of  $\text{Aut}(T_\infty)$ . By explicitly computing the discriminant of a PCF map, we are able to find two kinds of infinite index subgroups of  $\text{Aut}(T_\infty)$  such that the arboreal Galois group of any PCF map can be embedded into one of them. People have found a family of PCF maps, called single-cycle Belyi map, of which the arboreal Galois groups are isomorphic to one of the subgroups. We are able to find a new PCF map that is also isomorphic to the subgroup.

**Organizer** : Wei-Bo Su (Academia Sinica), Peng-Jie Wong (National Center for Theoretical Sciences)

[https://www.math.sinica.edu.tw/www/file\\_upload/conference/2016TPS/index.html](https://www.math.sinica.edu.tw/www/file_upload/conference/2016TPS/index.html)

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