



# THE FIELDS INSTITUTE

Thematic Program on Abstract Harmonic Analysis, Banach  
and Operator Algebras



## SORIN POPA

University of California, Los Angeles

*Coxeter Lecture Series*

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**AT THE FIELDS INSTITUTE**

**On  $\text{II}_1$  factors arising from free groups acting  
on spaces**

A famous problem going back to Murray and von Neumann (1936-1943), asks whether the  $\text{II}_1$  factors  $L(\mathbb{F}_n)$ , obtained as the centralizers in  $\mathcal{B}(\ell^2\Gamma)$  of the left regular representation of the free groups on  $n$  generators, are non-isomorphic for different  $n$ . While this is still open, its "group measure space" version, asking whether the crossed product  $\text{II}_1$  factors  $L^\infty(X) \rtimes \mathbb{F}_n$ , arising from free ergodic probability measure preserving actions  $\mathbb{F}_n \curvearrowright X$ , are non-isomorphic for  $n = 2, 3, \dots$ , independently of the actions, has recently been settled by Stefaan Vaes and myself. I will comment on this result, as well as on some related problems.

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