



Series of conferences on **Advances in Representation Theory of Algebras (ARTA)**  
Guanajuato-Toruń-Montréal  
Guanajuato, Mexico. June 22-26, 2015.

**REGISTRATION FORM**

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**TITLE:** Bigraphs, bilinear lattices and the Coxeter spectral analysis in representation theory

**ABSTRACT:** We start with a brief survey on recent results, mainly due to D. Simson et al., concerning  $\mathbb{Z}$ -linear and combinatorial analysis of edge-bipartite graphs (= bigraphs), which can be treated as an abstraction and a natural generalization of the Tits form(alism) of an algebra. We recall certain non-trivial classification results and give a short sketch on so-called mesh-geometries on root systems associated with a bigraph (a formal approach to K-theoretical aspects of Auslander-Reiten theory in the derived category of an algebra of finite global dimension).

We show how the above setting is related to the notion of Lenzing's bilinear lattice, Coxeter spectral analysis in representation theory of algebras and recent results concerning periodicity in bilinear lattices, quadratic forms and cyclotomic factors of the Coxeter polynomial (joint work with J. A. de la Peña).

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