Olena Tertychna (Kyiv Taras Shevchenko University, Kyiv, Ukraine)

Representation type of semigroups generated by idempotents with partial null multiplication

This is joint work with Professor V. M. Bondarenko.

Let $I$ be a finite set without 0 and $J$ a subset in $I \times I$ without diagonal elements (i.e. those of the form $(i, i)$). Denote by $S(I, J)$ the semigroup with generators $e_i$, where $i \in I \cup \{0\}$, and the following relations:

1) $e_0 = 0$;
2) $e_i^2 = e_i$ for any $i \in I$;
3) $e_i e_j = 0$ for any pair $(i, j) \in J$.

We study finite-dimensional representations of such semigroups over any field $k$.

To each pair $(I, J)$ ($I$ being a finite set and $J$ a subset in $I \times I$ without diagonal elements) we associate the oriented graph $\Gamma(I, J) = (\Gamma_0, \Gamma_1)$ as follows. The set $\Gamma_0$ of vertices of $\Gamma$ is equal to $I$ and the set $\Gamma_1$ of arrows of $\Gamma$ consists of all arrows $i \rightarrow j$ with $(i, j) \notin J$, $i \neq j$.

We prove the following theorems.

**Theorem 1.** A semigroup $S(I, J)$ is of finite representation type over a field $k$ if and only if the graph $\Gamma(I, J)$ is a disjoint union of Dynkin diagrams (with some directions of edges).

**Theorem 2.** A finite semigroup $S(I, J)$ is of tame representation type over a field $k$ if and only if the graph $\Gamma(I, J)$ is a disjoint union of ordinary and extended Dynkin diagrams (with some directions of edges).