

January 27, 2016

Dear Ms. Papazova:

This is in answer to your request for a letter concerning Tatiana Ivanova's possible promotion to Professor. It is essentially identical to a letter that I sent some years ago, and for what I thought was the same purpose. I'm very surprised that Tatiana wasn't promoted long ago. She is an accomplished mathematician who has made substantial contributions to her field.

I know Tatiana from her work and also because she visited M.I.T. several times. Her research is on the theory of associative rings, and her early work was on complexity and effective computability. This work culminated in a joint paper with Latyshev which discusses algebras having a finite Gröbner basis. They obtained interesting results on the effective computability of various properties that a monomial algebra may have.

Her next work is on a class of algebras which she calls strictly ordered, which means roughly that the lexicographic ordering on normal monomials is preserved under left and right multiplication. Skew polynomial rings are examples of strictly ordered algebras. She obtains the remarkable result that such a ring is noetherian if and only if it has polynomial growth, and this is so if and only if the normal monomials, with the law of composition which is obtained naturally from the multiplication law of the algebra, form a commutative semigroup.

For several years, Tatiana concentrated on algebras with quadratic binomial relations. She succeeded in proving that, with certain supplementary hypotheses, such an algebra is regular, in particular noetherian, and is a free module over an almost commutative subalgebra. This is a beautiful result.

In joint work with Michel Van den Bergh on semigroups with binomial relations, Tatiana showed that if a set of relations defines a Gröbner basis in a suitable sense, then it also yields a solution to the set-theoretic Yang Baxter equation. She also proved converse to this theorem.

Tatiana's promotion is overdue.

Sincerely yours,

Michael Artin
Professor of Mathematics
Massachusetts Institute of Technology

PS. This should suffice. However, if you want me to fill out the documents that you sent, please provide a fax number.