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**Valentina S. Harizanov\*** ([harizanv@gwu.edu](mailto:harizanv@gwu.edu)), George Washington University, Department of Mathematics, Washington, DC. *Back and forth through computable model theory.*

Interaction of computability theory with model theory and other areas of mathematics has resulted in computable model theory. We use computability theoretic tools and methods to study various algorithmic phenomena on countable mathematical structures. Hence computable model theory also aims to better understand how algebraic properties of structures interact with the algorithmic ones. We will survey some earlier results and present recent developments in our investigation of the computability theoretic complexity of structures and their isomorphic copies, complexity of additional relations on structures, complexity of automorphisms, and the correspondence between computability and definability. For example, we will show how Turing degree spectra of relations relate to the degree spectra of structures via the so-called spectrally universal structures. We will present results in general model theoretic setting, as well as results about concrete well-known classes of algebraic structures.

[1] W. CALVERT, V. HARIZANOV, J. KNIGHT, AND S. MILLER, *Index sets of computable structures*, to appear in **Algebra and Logic**.

[2] J. CHISHOLM, J. CHUBB, V. HARIZANOV, D. HIRSCHFELDT, C. JOCKUSCH, T. MCNICHOLL, AND S. PINGREY,  $\Pi_1^0$  *classes and strong degree spectra of relations*, submitted.

[3] B. CSIMA, V. HARIZANOV, D. HIRSCHFELDT, AND R. SOARE, *Bounding homogeneous models*, to appear in the **Journal of Symbolic Logic**.

[4] B. CSIMA, V. HARIZANOV, R. MILLER, AND A. MONTALBÁN, *Computability of Fraïssé limits*, in preparation.

[5] M. DABKOWSKA, M. DABKOWSKI, V. HARIZANOV, AND A. TOGHA, *Spaces of orders and their Turing degree spectra*, in preparation.

[6] V. HARIZANOV, C. JOCKUSCH, AND J. KNIGHT, *Chains and antichains in computable partial orderings*, in

preparation.

[7] V. HARIZANOV AND R. MILLER, *Spectra of structures and relations*, to appear in the **Journal of Symbolic Logic**.

[8] V. HARIZANOV, R. MILLER, AND A. MOROZOV, *Automorphism degree spectra*, in preparation. (Received September 20, 2006)