

## NSF CAREER Award

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### **H. Metin Aktulga to tackle extreme-scale scientific computing and data analytics using NSF CAREER Award**

An assistant professor at Michigan State University will use a National Science Foundation Faculty Early Career Development (CAREER) Award to develop novel algorithms and software to help computational scientists and big data researchers pare down the challenges of performing large-scale computations on massively parallel computer



systems.

H. Metin Aktulga, of the Department of Computer Science and Engineering, was awarded \$500,000 over five years for a project called, “Scalable Sparse Linear Algebra for Extreme-Scale Data Analytics and Scientific Computing.” The grant began in February.

Aktulga explained that programming can be difficult but parallel programming is even more so.

“Developing parallel software to execute efficiently on high-end systems with many core processors, GPUs, and deep memory hierarchies can be an insurmountable task for many scientists and engineers,” he said. “In this project, we focus on computations involving sparse matrices and graphs as they appear in several areas of big data analytics and scientific computing.

“We essentially aim to develop a framework which will allow scientists and engineers to express their sparse matrix-based solvers through a simple interface. Parallelization, performance optimization, and efficient access to large data sets would then be handled by the framework behind the scenes.”

Aktulga said that K-12 outreach is also part of his CAREER Award. In collaboration with colleagues, he recently started a non-profit educational organization called Absolute Academy ([www.absoluteacademy.net](http://www.absoluteacademy.net)). The academy will offer mathematical and algorithmic problem solving courses in a summer camp setting. Plans also call for a scholarship

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program for socio-economically disadvantaged students with high academic skills.

Aktulga joined MSU in August 2014. His research interests are in high performance computing and applications of parallel computing. He works on the design and development of parallel algorithms, numerical methods and software systems that can harness the full potential of state-of-the-art computing platforms to address challenging problems in large scale scientific computations and big-data analytics problems. His specific research topics include molecular modeling and simulation, computational nuclear physics, and machine learning.

Since 2012, his PhD work on parallel reactive molecular dynamics simulations has consistently been recognized by ScienceDirect among the Top 25 articles published in the Parallel Computing journal. His conference publications have been nominated for best paper awards at HPCS 2011 and SC 2013 conferences.

Originally from Turkey, he received his bachelor's degree from Bilkent University (2004), and master's (2009) and doctorate (2010) degrees from Purdue University, all in computer science. Prior to joining MSU, he was a postdoctoral researcher in the Scientific Computing Group at the Lawrence Berkeley National Laboratory.

Aktulga is the 17<sup>th</sup> faculty member in the College of Engineering to receive an NSF CAREER Award since 2010. NSF CAREER Awards support junior faculty who exemplify the role of teacher-scholars through outstanding research and education. It is among NSF's most prestigious honors.

[Read the NSF abstract.](#)

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