Donna J. Michalek

In the heart of Washington, DC, Senator James Inhofe prepares to question the Secretary of Defense about the United States' Strategic Offensive Reduction Treaty with Russia. Behind him, Dr. Donna Michalek—the senator's nuclear subject matter expert and the author of the questions for the hearing—watches as Inhofe straightens his shoulders and directs the first query to Donald Rumsfeld. Michalek studies the Secretary's expression as he pauses to consider, silently cheering when Rumsfeld smiles and says, "Excellent question, Senator Inhofe. That's a difficult one." Looking back, Michalek recalls her thoughts. "That simple comment was reward enough for the hard work that went into the preparation for the hearing. It was a highlight of my sabbatical year as an aide on Capitol Hill, and I came away from the experience invigorated and motivated."

Michigan Tech Professor Donna Michalek finds inspiration in diverse professional challenges. As the newly appointed Associate Chair and Director of Undergraduate Studies of the ME-EM Department, Michalek will add to her considerable list of responsibilities. In addition to teaching and research activities, she serves as the Chair of Curriculum Committee, Co-chair of Design Committee, Chair of Diversity Committee within the ME-EM Department, and the Director of Faculty Success and Diversity in the College of Engineering. She also serves outside of the university on the Board on Government Relations for the American Society of Mechanical Engineers (ASME). Michalek thrives on her full schedule, saying, "I work best when I have multiple challenges—the continual opportunities to learn energize me, and I find that these varied experiences inform my academic career."

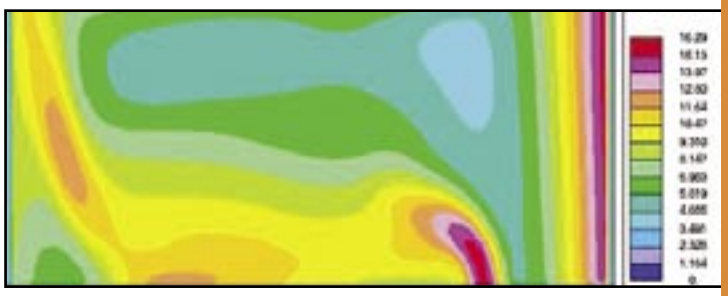
Michalek received her BS from Clarkson University in 1985 and joined the Edison Engineering program at General Electric, earning her MS concurrently from Rensselaer Polytechnic Institute. After three years in industry, Michalek began her PhD studies in Aerospace Engineering at the University of Texas at Arlington. In 1993, eager to undertake new academic challenges, she joined the faculty at Michigan Tech, where she could contribute to research, teaching, and building diversity.

Michalek's research centers on Computational Fluid Dynamics (CFD)—specifically, the development of new algorithms and the applications of existing algorithms. The majority of her work in algorithm development is done with genuinely multidimensional solvers for the Euler equations on both structured and unstructured grids. In the area of applying existing algorithms, her work ranges from analyzing the fluid flow through a fuel injector to simulating the mist generated during a machining process. All of these efforts utilize highly quantitative techniques to gain a deeper understanding of a physical process with its improvement as the ultimate goal.

With her latest research venture, Michalek departs from standard quantitative techniques. The project, which will examine issues of diversity in Mechanical Engineering, stems

from her participation in the 2006 Institute for Scholarship on Engineering Education (ISEE). "The research aims to identify the factors that affect the choice of discipline by undecided first year women and minority engineering students at Michigan Tech. Over the course of the year, I will interview and survey students to discover the reasons that motivate their decision." Michalek hopes that her findings will aid the ME-EM department as it continues to cultivate diversity in its student body. "The climate in the Mechanical Engineering world has improved considerably over the past decade for women and minorities, and we'd like to encourage continual growth in that area. My research will help determine additional ways to achieve a more diverse student body in the ME-EM Department."

Michalek embraces the challenges posed by the qualitative methods utilized for the project, saying, "Most of my work is done quantitatively, but different approaches force me to think outside of the standard engineering 'box.' I seek out opportunities that require me to develop new practices and procedures." She cites her sabbatical year as an example. In 2002, she served as an ASME Congressional Fellow, working as an aide and subject matter expert in the office of Senator James Inhofe. In that capacity, Michalek wrote position papers,



conducted research, responded to constituent concerns, and prepared the senator for hearings. She regards the experience as a milestone in her professional development and speaks of it enthusiastically. "I witnessed the hard work, dedication, and genuine spirit of cooperation on the Hill, and came out of the experience with a firsthand understanding of the political process and how it affects academic decision-making and funding."

Michalek is confident that this knowledge will serve her well as Associate Chair. She looks forward to the next phase of her professional journey, commenting, "This position opens up another area of education and allows me to be involved on a new level. My experiences have prepared me well, and I'm thrilled to have the opportunity."