High school students' paper published in prestigious college math journal

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A paper written by four students from High Technology High School in Lincroft, New Jersey, entitled Ethanol: Not All It Seems To Be has been published in the January 2009 issue of The Mathematical Association of America's *College Mathematics Journal*.

The paper, which was the winning submission in the 2008 Moody's Mega Math Challenge, is the first M3 Challenge entry to be published in a peer-reviewed journal. It was submitted to the Internet-based applied math competition last March by Afanasiy Yermakov and Jason Zukus, current seniors at High Technology High School, Tom Jackson, now a freshman at Cornell University, and Kelly Roache, currently a freshman at Princeton University. Coached by their math teacher Dr. Raymond Eng, the students shared $20,000 in scholarship prizes for their efforts.

The paper, which was researched and written in less than 14 hours per contest rules, concluded that, in addition to the negative economic and environmental implications of replacing gasoline with ethanol, the plan would not be cost effective until oil prices reached over $233 per barrel. The students also found that corn-derived ethanol might not be the best alternative form of energy, suggesting that nuclear power may actually be a better choice for attaining national energy independence. The paper can be accessed at www.maa.org/pubs/cmj47.pdf .

Over 250 teams from lower New Hampshire to Wilmington, Delaware, submitted viable solutions to the 2008 Challenge problem, Energy Independence Meets the Law of Unintended Consequences. Student

teams were required to address issues associated with increased corn-derived ethanol production and fuel substitution and relate these matters to dramatic and unanticipated rises in farm commodity pricing, the future of food supplies in developing nations, the effect on carbon dioxide emissions, and the cost-effectiveness of producing ethanol. Teams had 14 hours to quantify these concerns using mathematical-modeling techniques, develop and defend their models and justify their conclusions. Judging for Moody's Mega Math Challenge is blind, with judges knowing teams only by their team ID number until the final round of judging. In 2008, eleven teams were awarded scholarship prizes totaling $65,000.

The Challenge is an Internet-based applied mathematics competition that requires student teams to solve an open-ended, realistic, challenging modeling problem focused on real-world issues. The Moody's Foundation initiated and provides the funding for the Challenge; the Society for Industrial and Applied Mathematics (SIAM) organizes and administers the contest. "Our goal, and the goal of the competition, is to motivate high school students to think about solving real-world problems using applied mathematics," said Frances G. Laserson, President, The Moody's Foundation. "We want to increase students' interest in pursuing studies and careers related to math, economics, and finance." In 2009, the Challenge is open to high schools from all New England and Mid-Atlantic states and will award $80,000 in scholarship prizes.

For more information on the Challenge including photo galleries and webcasts of the presentations, visit m3challenge.siam.org .

Source: Society for Industrial and Applied Mathematics

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