

What is flame? Utah grad's explanation wins science prize

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Several months ago, actor Alan Alda issued a challenge to the world's scientists: Explain flame in a way that's easily understood by an 11-year-old.

Hundreds of entries from around the world, in the form of poems, graphics, essays, videos and songs, poured into Stony Brook University, which hosted what became known as the **Flame Challenge**. Among them was a seven-minute cartoon by a University of Utah graduate named Ben Ames, featuring a scientist explaining fire to a bearded prisoner chained in a flame-filled dungeon. At the World Science Festival in New York City Saturday, Ames' entry was declared the winner, chosen from among six finalists by 2,000 school kids from around the globe.

"I also have a passion for music, film and the performing arts. So when I learned about this wonderful contest, I had finally found a project where I could put all of my interests to use," said Ames, 31, now a doctoral candidate in quantum physics at the University of Innsbruck.

Ames grew up in Missouri and started college at Utah State University in 2002 with the idea of going onto law school. After three years studying political science, he realized hard science was more to his liking and essentially started over at the U. He graduated in 2008 with a bachelor's in applied physics.

The idea for the competition goes back 65 years when Alda asked his sixth-grade teacher to explain the hot spike at the end of a burning candle. Her answer, "It's oxidation," was rather unfulfilling.

"I knew there had to be more to the mystery of a flame than just giving the mystery another name," Alda wrote in a guest editorial appearing March 2 in *Science*. "That was a discouraging moment for me personally, but decades later I see the failure to communicate science with clarity as far more serious for society."

The actor known for the role of Hawkeye Pierce on the TV series "M*A*S*H" now uses his celebrity to promote science literacy. Alda became aware of scientists' penchant for relying on jargon while interviewing them for the public television program "Scientific American Frontiers." In response, he helped launch the Center for Communicating Science at Stony Brook.

Alda proposed the **Flame Challenge** as "a playful experiment" to draw attention to the need for scientists to a better job talking about what they do.

"We try to avoid the metaphor of wildfire, but it really did take off," said Elizabeth Bass, director of the center.

Ames heard about the challenge while listening to Alda being interviewed on "Science Friday," the public radio program hosted by Ira Flatow. The April 2 deadline was only 10 days away, so he disappeared into his basement to develop his idea, animating the piece using Flash software to illustrate atoms and molecules in imagery that kids would instantly recognize. The animation walks viewers through the chemical processes that combine oxygen in the air with the hydrogen and carbon in a candle to produce heat and luminescence. He produced every component himself, from the script to the music.

"I wanted to take out all the unnecessary, intimidating factors," Ames said. "I wanted to make sure I improved their science vocabulary, but I wanted to make it entertaining enough so that people wanted to see it again."

To conclude his piece, Ames composed, performed and recorded a song that summarized the scientific concepts — pyrolysis, chemiluminescence, oxidation and incandescence — described in the video

"The fuel loses mass, it turns to a gas. (Oh, yeah!) Before the next change is through, atoms shine blue. When the process is complete, it gives off heat. Extra carbon will glow red, orange and yellow," sings Ames, sounding a little like Coldplay's Chris Martin.

More than 130 schools, including West Valley City's Douglas T. Orchard Elementary School, volunteered their fifth- and sixth-graders to help identify finalists among the 535 entries that a panel of scientists deemed worthy. The Ames piece made the first cut and was shown to some 2,000 kids, along with five other entries created mostly by engineers, in a "worldwide assembly" on May 9-10, where it was the top vote-getter. For his effort he won a flame-shaped trophy and a Flame Challenge T-shirt, along with trip to the science festival.

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