

Isaac Chang

11th Grade (Junior)

Hobbies: Physics, chemistry, math, jogging, chess, swimming, modifying/reprogramming 3D printers, modifying/reprogramming everything else, writing increasingly improbable scenarios into physics questions

Clubs: Science Bowl/Physics & Chemistry Club (founder), Math Team, Chess Team, German Club

Competition Experience and Honors:

US Physics Team (2024); US Physics Olympiad (USAPhO) Silver Medalist (2023)

US National Chemistry Olympiad (USNCO) High Honors (2022)

US Mathematical Olympiad (USAMO, 2024)

National Science Bowl Illinois State Regional - 2nd Place Team Captain (2024)

National German Exam Gold Medalist (2024)

Pivotal International Essay Competition Finalist (AI Category, 2024)

Autobiography:

My first understanding of physics came from asking questions. I'd always wanted to understand the intuition behind why things happened the way they did. Airplanes benefited from having their wings (while rockets didn't), elevators and turning cars made gravity quite janky, my bicycle was surprisingly docile at high speeds, that kind of thing. *Why?* And then there were the oddballs – often literally not of this world, from the stars and galaxies above to atoms and molecules, inscrutable and ubiquitous. As the pile of trivia I amassed about them grew, so did my questions about them – why dark matter was dark, why quantum was quantum, why entropy was a thing. But above all: how did these “work”? What rules, if any, did they obey?

When I was around 9, I stumbled upon some of Prof. Walter Lewin's lectures. In those lectures – and, once I had finished them, in HRK – I found many of the answers I sought in physics. The same fundamental, universal principles, applied in different ways, explained everything from rocket propulsion to gyroscopes to Bernoulli's law. These were some of the unities I had once sought, and everything slowly began to make sense. And there were other phenomena, too, that I discovered while studying physics over the following years, more fundamental yet equally intriguing – from the simple ball-rolling-down-plane to the most intricate E&M setups, whose ultimately simple, elegant explanations I learned and relished. Surrounded by open textbooks and a mountain of scratch paper, I found beauty incarnate in the intuitive elegance of these ideas. I bashed through enough mechanics and E&M to finish AP Physics in 7th grade.

I got started with USAPhO a couple years later. One day in early sophomore year (actually, the same day I registered for $F=ma$), one of my friends mentioned in passing the existence of an intriguing opportunity: an olympiad in physics. It turned out that my early emphasis on intuition enabled me to navigate the intricacies of the competitions better than most: in 2023, I became my school's second USAPhO qualifier and went on to earn a silver medal, even though I slogged away an entire solve. This year, with better preparation, the aid of Kevin Zhou's handouts, and an ironclad commitment to cross-multiplying correctly, I was pretty sure, after the test, that I did better than last year, and maybe had a good shot at gold. Then I got the email that I had made the national team.

In many ways, participating in the Physics Olympiad has completed the pursuit of understanding that I began almost half a decade ago. It has shown me the simple, elegant principles behind everything from why refrigerators and heat pumps work to why rainbows form (2022 A3) to why ice melts when you step on it (2023 A3) to why white dwarves don't collapse in on themselves (2024 A2). It's opened my eyes to more than physics alone – it's given me insight into the fundamental workings of the world and given me the ability to begin to understand the intricacies of the universe at large.

I'd like to thank AAPT for organizing these competitions and giving me this wonderful opportunity. I'd also like to thank Mr. Kennedy and Dr. Fuhrer for their invaluable guidance and support at school. I'm also grateful to Dr. Velicu, Dr. Sonde, Dr. Grein, and Dr. Siva for giving me the opportunity to study and work with physics in the lab/practical environment, and for their enjoyable lectures on practical physics. It's truly an honor to be on this team – and I look forward to meeting everyone at camp!