

Student Profile Sarah Trowbridge '08

While an undergraduate at MIT, Sarah Trowbridge balanced dual challenges: the intellectual rigor of sustaining a Course 8 major, and the physical strength, endurance and finesse of intercollegiate gymnastics. Sarah, a Boulder, CO, native, wrapped up her senior year on the MIT women's gymnastics team with a personal best score in the all-around field, and was named to represent MIT on the NCGA (National Collegiate Gymnastics Association) Division III Senior "All-Americans in Academics" list. An aspiring astrophysicist, she enters MIT's graduate physics program this fall as a prestigious Whiteman Fellow.



Sarah
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physics@mit: Sarah, congratulations on your impressive accomplishments in both physics and gymnastics while an MIT undergraduate! Achievement in either one of these fields is notable; how did you manage to do both, simultaneously? Did the special environment of either MIT or the Physics Department play a role?

Sarah: I started gymnastics when I was five years old, and got interested in astrophysics when I was in sixth grade and took an astronomy class. Throughout high school I was able to keep up with school, gymnastics and playing violin largely because my gym required fewer workout hours than most and because my parents were extremely supportive. In the past four years [at MIT], I've been helped enormously by both the environment at MIT and the unique atmosphere of the MIT gymnastics team. My favorite thing about MIT is that everyone is passionate about what they do, so it didn't feel like I was attempting the impossible, because everyone else had a million activities, too.

The MIT gymnastics team was a key ingredient in my ability to keep up with both physics and gymnastics. The coaches understood our academic commitments and always stressed that school came first: they put together flexible workouts so that we could work our gymnastics around academic commitments. The team itself was incredible. Everyone was completely supportive of every other team member, not only in gymnastics but in every other part of life. Whenever life got stressful or overwhelming, there were twelve other girls in exactly the same position as you and ready to do anything they could to help.

The summers both before and after my freshman year at MIT I worked at the National Institute of Standards and Technology (NIST) with Dr. **Leo Hollberg** [Group Leader, Optical Frequency Measurements Group]. Having been a collegiate gymnast

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during his undergraduate career, he was an inspiration to me and a great help with advice throughout my undergraduate career. At MIT, I worked for a little over a year in a UROP with Dr. **Michael Nowak** [Research Scientist, MIT Kavli Institute for Astrophysics and Space

Research], who taught me how to program, how to write a journal article, and introduced me to data analysis—and couldn’t have been more understanding with my constantly rushing off to gymnastic practice. Later on, I did my thesis work with Professor **Joe Formaggio**, who was also my first semester Junior Lab instructor. I’ve learned a huge

amount about the process of building an experiment by working with Prof. Formaggio, and he has given me great opportunities to see what working in physics is really like.

physics@mit: While MIT students have a long history of enthusiasm for blending intellectual and athletic pursuits, the linkage between physics and gymnastics seems particularly intriguing. What was your most memorable learning experience while pursuing these dual passions over the past four years? Any advice for incoming MIT freshman with similar aspirations?

Sarah: I’ve always thought that physics and gymnastics worked extremely well together because gymnastics is all about physics: making the body do what is necessary to overcome gravity for just a little bit in order to get a skill completed. I have so many great memories from my time on the MIT gymnastics team of countless technical conversations, which I think could only happen in a gym at MIT, and many long bus rides with the whole team bent over laptops working.

Perhaps my most memorable experience involving both physics and gymnastics was learning a **GEINGER**, a release move on the uneven bars. [Ed. note: visit www.drillsandskills.com/images/display?path=ubar6.gif for an animated illustration.] One of the men’s assistant coaches was a graduate student who had done his undergraduate work in physics. He explained the swing and positions to



Sarah's balance beam mount at the West Chester gymnastics competition during her sophomore year.

me in terms of physics and where the energy was at any point in the skill, such as the kinetic energy of the body swinging, the potential energy of the bar bending, etc. This helped me to understand the skill so much better than I would have if I had just been told what I was doing wrong.

For an incoming freshmen with similar aspirations, I would say go for it! From my own experience, there is no better place to pursue both physics and gymnastics than MIT. Also, I would advise anyone not to hesitate to ask for help. I could not have gotten through many of my classes here without the help of faculty office hours. Professors are usually excited to help students, and many are interested in and supportive of outside activities.

physics@mit: Launching a graduate career in physics as an MIT Whiteman Fellow is a special opportunity. What are some of your goals for this new, exciting phase of your career? Will gymnastics still have a role to play, somewhere in the future?

Sarah: I'm very excited to start my graduate career and continue working in astrophysics. Some of my goals include learning more about how instrumentation affects the data from an experiment, about the exciting problems waiting to be solved in astrophysics, and how to make

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a useful contribution to my experiment. I first became interested in astrophysics in the sixth grade when I read about supernovae while researching a paper on blue giant stars. Since then I've always wanted to do research on supernovae and I'm thrilled to get the chance to do so.

As far as gymnastics goes, I plan to begin as an assistant coach for the women's gymnastics team here at MIT next year. While my eligibility for NCAA competition is over, and I'm getting pretty old to continue doing gymnastics myself, I will probably sneak in a little bit of time working on my favorite events when I can. Otherwise, I'm just excited to stay involved with the team and to see the sport from a new angle.

—Carol Breen, Communications Administrator
MIT Department of Physics