**Why do you want to attend the Yale Summer Program in Astrophysics? What personal and academic goals do you hope to achieve at the program? [400 words]**

60° N, 8° E, 01:02 a.m., Jan. 30, 2018

Snowfield ahead, gale buffeting my jacket, I shiver. Enchanting is the Northern light overhead. As the colors dance engrossingly, I feel like an integral puzzle piece that connects seamlessly to the vast, infinite “big picture” of this universe.

What makes the universe marvelous? I did not get the answer immediately until I browsed through the *Astrophysics for People in a Hurry* in the school library.

Every second, the sun emits over one billion tons of matter from its surface. The “solar wind” takes shape, consisting of energetic charged particles with a speed of 1,600 km/s. These particles deflect when they penetrate the earth’s magnetic shield and collide with gas molecules in the upper atmosphere. These collisions result in countless bursts of light, which then form the aurora.

Astronomy captivates me, evokes my curiosity and satisfies it.

Then, I transferred to Pearson College UWC, with a burning desire to continue my astro-exploration with the telescope at Pearson College Observatory. As a member of our school astronomy club, I’ve learned far more than the theoretical knowledge, but the practical operations. Via a constellation map, I’ve learned to recognize the location of different stars; through the local astronomers invited, I’ve learned about how to use different telescopes and take astrophotography. There is a huge Newtonian telescope in our observatory but it’s too old to be used. We’ve decided to take it apart, clean it, change the lens, and code a new program for it, with which the telescope can be controlled remotely under various climatic conditions and become accessible to more sky watchers.

However, although I’ve conducted numerous astronomical field studies in the past year, I am still eagerly looking forward to having more in-depth research on astrophysics. Therefore, I desire to attend the Yale Summer Program in Astrophysics. I believe, besides the study of physics and math at Yale University, the possibility of researching about supernovae and its modeling at YSPA will significantly enhance my scientific research skills, for example, engineer-based programming, data processing, and research paper writing - all laying a solid foundation for my future research in any field.

I will embrace an unforgettable experience of astronomical observation at Leitner Observatory with telescopes that I could have no access anywhere else, and the RCOS and the Grubb refractor are so exciting even to hear about!

**What high school or college science courses have you taken? What were your favorite topics in these courses? [400 words]**

At present, I’m taking IB Further Math and IB Physics at a higher level, and IB Marine Science at a standard level.

I’m attending the class of IB Further Math (HL) with all second-year students, and plan to take the final exam with them in May this year. Since I’ll complete the course requirement of IB Further Math at the end of this semester, I intend to take the IB Chemistry (HL) to fill the vacancy of mathematics class next year. Therefore, I am currently teaching myself IB Chemistry and AP Chemistry to make sure that I will stay on top of the course progress of the next semester.

Last summer, I attended the Canada/USA Mathcamp, where I gained exposure to a series of college-level mathematics courses, whose topics included field theory, point-set topology, know theory, cluster algebra, and multivariable calculus. Among them, cluster algebra interested me the most. Currently, I’m working on my research about quasi-cluster algebra on non-orientable surfaces, mentored by Veronique Bazier-Matte, a Ph.D. candidate at UQAM, and Jon Wilson, postdoctoral at UNAM. I’ve completed the proof on the number of triangulations of Mobius stripe and the unstructurality of quasi-cluster algebras, but I’m trying to prove more.

Moreover, I’ve finished the self-instruction of the whole IB Physics syllabus, including from classical mechanics, wave phenomenon to relativity. Although there are not many topics directly related to astrophysics in my high school study of physics, Astrophysics is really one of my personal favorite topics, because, from my school Astronomy Club, supervised by my present Physics teacher, I’ve started a research project involving the study of the hidden symmetry and invariance in optical force. In the club, it’s also very hard for me to refuse the fascination of astrophotography, image processing and even conception of retrofitting our school telescope with remote control and automatic functions under various climatic conditions.

I am also into the application of different math tools in physics. Besides a research project proving the equivalence between the mathematical and physical solutions to a finite vibrating string, I am now interested in how Kaluza constructed the one extra dimension and almost magically constructed the fifth dimension with the aim of uniting the fundamental forces. Inspired by that, I’m conceiving another research project on tensor calculus and its application in string theory.

**What is your experience in computer programming? [100 words]**

I taught myself Python from online videos. Python was once a very helpful tool for me to solve challenging math problems, but now I have a better option - Mathematica, with which I graph everything I desire and compute complicated formulas. Moreover, with LaTex, I’ve grasped a good skill in scientific research writing.

While working with the robotics team in UWC-CSC, I learned to code with Javascript. To well prepare for HiMCM last November, I acquired the MATLAB skill for mathematical modeling. In Astrophysics Club at Pearson College UWC, I also studied to use tools, such as PixInsight, for astrophotography.

**What do you like to do for fun? [400 words]**

In my leisure time, I would collect omnifarious flavors of instant noodles from all over the world to build up my food reserves. Though I have eaten plenty, I constantly save more than I consume. In the hope of making instant noodles more delicious, I started to try various kinds of cooking styles to test and find out my preferences. I firstly watched videos on YouTube and then attempted my culinary creations. *Practice makes perfect.* After being enough, I came up with my own fresh ideas - instant noodle soaked in hot whole-fat milk, instant noodle cakes, and fried noodles with marshmallow sauce. In terms of the fried flavor, I’ve also thought of different tricks. Boil the noodles, drain the water to make cold noodles, and stir-fry them with ingredients; or stir-fry the toppings first and then pour them on the cold fried noodles. I’ve mastered dozens of creative cooking methods of instant noodles.

As an amateur and 24/7 hungry gourmet, I see my pursuit of delicious cuisine as an indispensable part of my personality. When I encountered a Yunnan cuisine, which is called scrambled eggs with jasmine, I would purchase the raw materials and tried to revive the dish myself. Moreover, I am fond of studying to make toast in eight different ways, cook scrambled eggs with tomato in five flavors. I love inventing new recipes, especially the ones that combine East Asian and exotic food together. Steamed meat of litchi soaked with Korean chili sauce, ice cream topped with fermented bean curd, or Thai rice fried in squid ink are my specials. The exploration of uncertainty always excites me. Reinvigorating a traditional dish also satisfies my curiosity. Tasty? Unpleasant? Or mediocre? It doesn’t matter. On the long, long list of crossed-out experiments, I did find a unique delicacy. I just can’t stand that routines render our lives dull. Special recipes stimulate our taste buds and evoke our thoughts.

I have created and recorded many innovative ideas, and I would like to put them into practice. This is also a little fun in my ordinary life. At YSPA, I look forward to coming up with more brilliant ideas in a truly diverse environment. I hope to make the transient summer community a more creative and fun place.

**Choose to answer *either* personal experience essay question, but not both. [400 words]  
1) What are you most proud of accomplishing in your life so far?  
or   
2) Tell us a story that illustrates your true character.**

Seven Hours. It was the most challenging and inspiring period in my life.

Together with my parents, I decided to climb Mt. Huashan. Knowing the mountain is one of the most precipitous ones in China and the sunrise on the mountain is spectacular, we were eager to try. However, if planning to witness the breathtaking view, we knew it was prudent to set out at night.

11:00 p.m. July 25, 2018.

At first, I felt like walking on flat ground as there was little to no incline on the pass. I teased the mountain for swollen reputation and laughed it was too simple a challenge for us. But soon, I began to realize I was downright naive. After 50 minutes of walking, I was still at the bottom of the mountain. And the next thing waiting for us was the endless steps, inclined at a steep 70 degrees and only wide enough for half afoot to step on.

02:00 a.m. July 26, 2018.

I began to admit that the mountain was a real challenge, perhaps the biggest one I’d ever encountered. Three hours of climbing had made an exciting expedition, an exhausting ordeal. Worse, the e-board showed our progress to be only halfway up the mountain.

I knew there was no way back. The night seemed to devour everything. It appeared so long and infinite; this darkest period of a day.

Yet, we trudged on. After all, imagine what a pity it would be if we couldn’t view the sunrise.

04:50 a.m. July 26, 2018.

Gritting our teeth, we pushed on towards the most dangerous parts of the mountain that is completely perpendicular.

The day got brighter and brighter. Unfortunately, my legs inevitably gave in. I felt such great pain that I couldn’t move forward. Fear arose with this pain. I was afraid I’d fail to summit the mountain with the rising sun. I squeezed my legs tightly and found momentary relief from the pain.

06:00 a.m. July 26, 2018.

The sun was rising so naturally, with no extra beauty. Amazingly, my body was standing on the top of the mountain. There was no tear of joy. No exclamations of the view. No feelings at all, just a deep, content peace.

The sun doesn’t change. It’s just being discovered after a long, long night. Also, I do not change. I’m just discovering myself through an exciting adventure.

**Opinion Essay: Yale Law School professor Amy Chua received much attention and some criticism for her 2011 book *Battle Hymn of the Tiger Mother*, in which she argued that the strict, disciplinarian parenting style of some traditional Chinese parents was best for preparing children for our modern, highly-competitive world. Others have argued that children do best when they are allowed to discover and pursue their passions at their own pace, rather than being forced to study a subject or practice a sport or instrument for hours a day when they don’t really enjoy it. What do you think? [400 words]**

I think it’s a matter of perspective. Instead of a debate on the means, it should be about the ends. Who wins this argument depends on whose vision of our present and future world is more accurate. I believe those who support the “Tiger Mother” mode of parenting may see our society as primarily capitalistic. Such a society is built upon many classic features of capitalism by Marx’s standard, such as strict division of labor and cruel exploitation of surplus-value, and most members of the society are confined to their roles as laborers being repressed. To earn one’s living, one must be at least a good labor, obedient, intelligent enough to understand instructions and efficient in carrying out orders. And this society is likely to struggle with feeding its population due to resource scarcity or problematically fast population growth. So, people have to compete fiercely to secure their employment, which is essentially equivalent to survival. It won’t be surprising that this society is full of hatred, anger, and unsettlement, giving an ideal condition to merciless class struggle.

Does the story sound familiar? Yes, a lot of such depictions come from my parents’ recalling of their upbringing when China was still a country of absolute poverty, so hungry for foreign capital, so desperate for development. It’s also similar to the history textbook that records Britain during the industrial revolution. If this was still and indeed our present world, then, no doubt, Tiger Mother won. But is it? China officially aborted its “One Child” policy a few years ago because to China, its human population already became less a liability but more an asset especially as its education system produces millions of college graduates every year. And, even the “labors” seem no longer confined to the mundane and alienation-inducing assembly line. We are increasingly living in a world where people constantly jumping into emerging industries with full energy, creativity, and enthusiasm while leaving behind the obsolete ones. Between the capitalists and proletarians, we have a growing and more powerful groups of middle-class, self-employed, freelancers and entrepreneurs, whose sizes and influence Marx failed to predict. It’s a world that China with its long and revered history of agriculture has never seen and now tries to embrace. So here’s my summarized point of view: our world has changed, so our educational principles have to change as well.

**Is there anything else the YSPA admissions committee should know about you when considering your application? (Please do not include test scores here... these will not be considered.) [250 words]**

No.