**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 higher level, and IB Marine Science at standard level.

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

I am also taking online open courses myself, like group theory, point-set topology, graph theory, number theory, multivariable calculus, linear algebra, etc. 这里把Mathcamp上过的大学课程，以及目前最喜欢的数学topics，做过的相关研究补上。

Among them, cluster algebra interests me most. I am stilling continuing my research on quasi-cluster algebra on non-orientable surfaces, mentored by Veronique Bazier-Matte, PhD at UQAM, and Jon Wilson, postdoc at UNAM. I have completed my proof on the number of triangulaitons on Mobius stripe and the unstructurality of quasi-cluster algebras. I am now more into basis and are still doing more reading upon that.

Moreover, I’ve finished the self-instruction of the whole IB Physics syllabus, including from classical mechanics, wave phenomenon to relativity. Although there is 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.

Also, I am 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 in 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.