个人陈述

尊敬的清华大学数学科学系的各位老师：

您好！感谢您在百忙之中抽出时间阅读我的个人陈述！

我叫刘易思，来自于中山大学物理与天文学院，主修物理学专业。同时，我也在中山大学数学学院（珠海）的数学与应用数学专业辅修学士学位。在本科阶段我取得了优秀的学业成绩，主修 GPA 为 4.147，辅修 GPA 为 4.0（均为 5 分制），在本专业排名为 6/126。

我所感兴趣的方向是数学物理，尤其是量子引力的相关内容。用数学和物理去理解我们所处的世界并挖掘其本质是我一直想做的事情。在我看来，想要做到这一点需要对我们所处世界的物理结构和数学结构都有着深刻的理解。而贵系拥有全国数一数二的数学物理专业，因此我十分渴望能够在贵系进行我的研究生学术生涯。

我已经具备了未来研究工作所需的物理知识。量子力学和广义相对论是从事量子引力工作所需要具备的最基础的理论，而在这两门课程上我取得了优秀的成绩（量子力学 95/100，广义相对论 99/100），因此我认为我的物理基础足够支撑未来的学习研究。**我也已经具备了基础的数学知识。**这学期我有上实变函数、复变函数、微分几何与泛函分析等课程内容，相信在这学期结束后我会有更完整的数学知识体系。**同时我也具备一定的研究能力。**在本科阶段，我参加过多次数学建模竞赛，在 MathorCup 和 APMCM（亚太赛）中分别获得一等奖和二等奖。在数学建模中，我主要做了建模分析和英文论文写作等工作。我还积极参加过各种研究项目。在大二加入天格计划理论组做负责人，主要做了伽马暴（GRB）的理论模型（火球-激波模型）、用 Geant4 模拟分析光子运动轨迹以及部分数据处理工作。我还负责了大创项目《利用天格卫星探测太阳风的可行性分析》，在其中主要做了模拟分析太阳风粒子在闪烁体中运动轨迹等工作。**这些竞赛以及研究工作培养了我的跨学科思维能力、英文论文写作能力以及理论研究能力。**就量子引力具体方向而言，我院的孙佳睿副教授正在做量子引力的物理研究，而我加入了他的讨论班，对量子引力内容已有了一些基本的了解。

对于未来学习研究生涯，我有如下规划：1.在本科剩余时间内，我将学习完数学系所有的本科课程，为自己打下扎实的数学基础；在大四上学期，我将着重学习经典力学的数学理论、量子场论的物理理论；在大四下学期，我将着重学习量子场论的数学和物理理论。2.在进入研究生生涯后，第一年我会继续量子场论的数学理论和物理理论的学习，尝试从各种角度（代数、拓扑角度）去理解量子场论内容；第二年我会开始学习弦理论。3.进入研究生之前，持续了解量子引力内容，参加量子引力相关讲座学习；进入研究生后，将进行专业的论文阅读以及学习。4.持续进行英文阅读和写作训练，以协助研究工作的开展。

数学物理是我最喜欢的领域。如果我有机会能够在贵系学习，我将不负贵系和自己的期待。再次感谢您拨冗抽出时间阅读我的个人陈述！

学生：刘易思

2023 年 4 月 14 日

Personal Statement

Dear teachers:

Hello! I am Liu Yisi from School of Physics and Astronomy, Sun Yat-Sen University. I major in Physics and minor in Mathematics and Applied Mathematics. In the undergraduate studies, **I have got the GPA of 4.147/5.0 in my major and 4.0/5.0 in my minor, with the rank of 6/126 in my major.**

Using mathematics and physics to study and comprehend our world is what I am interested in and what I want to study in the graduate career. When I first learned Theoretical Mechanism, the unity of the classical world in the Principle of Least Action, which implies and depicts how the matters move, attracted me deeply. But I can't quite understand it from the lack of mathematics. So after that, I took mathematics as my minor in order to learn things more essentially. Both mathematics and physics are used to study the world, with the difference that mathematics is used to study all possible world but physics is used to study the universe we live in. One has to learn physics and mathematics well to have a better understanding of our world. Mathematical Physics is the preponderant discipline of Department of Mathematical Science and Yau Mathematical Science Center. I really hope I can study and grow here.

Quantum Gravity is the domain I am most interested in. I first knew quantum gravity in the article on the official accounts of Yau center, which introduced professor Hung Ling-Yan and her research fields. After that, I contacted with professor Sun Jia-Rui in my college, who is a master in quantum gravity, and professor Wu Zhi-Wei in School of Mathematics(ZHUHAI), who is a master in Mathematical Physics. They offered me great help to study it.

Up to now, **I have acquired enough physical knowledge for future studies** and I am learning real function, complex function, differential geometry and functional analysis these days. I got great scores in Quantum Mechanics(95/100) and General Gravity(99/100), which are the fundamental knowledge for quantum gravity. **I also engaged in some mini academic programs**, such as Gamma Ray Integrated Detectors(GRID) and an innovation program for college students entitled "The Feasibility Analysis of Solar Wind Measurement Using GRID Satellite", **where I trained my paper writing skill, interdisciplinary thinking ability and research ability.** I also join a seminar with quantum gravity as theme which is held by professor Sun Jia-Rui. **My dual degree background will also provide unique advantages for the further studies.**

In the approaching graduate career, I make some plans as follows:

1. I will continue to accumulate mathematical and physical knowledge in my last

undergraduate career. Quantum field theory, mathematics for classical mechanics and mathematics for quantum field will be primarily considered.
2. During the first year of graduate school, I plan to continue to learn mathematical theory and physical theory for quantum field with different aspects(algebra and topology). The next year I schedule to learn string theory.
3. Keep concerning the news of quantum gravity and attending seminars with respect to it before graduate career. Start reading papers with respect to quantum gravity after becoming a graduate student.
4. Do English reading and writing exercises persistently in order to assist in the development of research work.

Mathematical Physics is my favorite research field. I would very appreciate it if I have a chance to study in your department!

Thanks for reading!

Student: Liu Yisi
2023.4.14