

研究生课程教学大纲（Syllabus）

课程代码 Course Code	ASTR8107	*学时 Teaching Hours	48	*学分 Credits	3
*课程名称 Course Name	行星天体物理学				
	Planetary Astrophysics				
*授课语言 Instruction Language	English				
*开课院系 School	School of Physics and Astronomy				
先修课程 Prerequisite					
授课教师 Instructors	姓名 Name	职称 Title	单位 Department	联系方式 E-mail	
	Masahiro Ogihara	Associate Professor	TDLI, School of Physics and Astronomy	ogihara@sjtu.edu.cn	
*课程简介（中文） Course Description	这门课程将让学生们初步了解行星动力学和行星形成。了解行星动力学对于理解天体物理学中一些关键问题至关重要。本课程将涵盖行星系统的动力学理论，包括二体问题、三体问题、潮汐、共振、自转、轨道长期演化等，我们将使用数学公式和轨道积分方法对这些问题进行研究。本课程还涉及行星形成理论，这是行星研究的基础。我们将结合理论和观测，描绘行星形成的物理图像。具体内容包括原行星盘的结构和演化、星子的形成、类地行星形成、气体行星形成、行星轨道演化等。这门课程的对象是天体物理专业的研究生，不要求熟悉行星研究和高级动力学的背景知识。				
*课程简介（English） Course Description	In this course, students learn about planetary dynamics and planet formation. A knowledge of planetary dynamics is essential for understanding some of the most interesting problems in astrophysics. This course will cover theories of planetary dynamical systems. Specifically, two-body problem, three-body problem, tides, resonances, spin, long-term evolution will be studied using mathematical formulas and orbital integration. In addition, this course covers the theory of planet formation, which is the basis of planetary researches including theory and observation, from a physical perspective. Specifically, structure and evolution of protoplanetary disks, planetesimal formation, terrestrial planet formation, gas planet formation, planetary orbital evolution will be studied. This course is intended for graduate students in astrophysics and does not require familiarity with planetary studies and advanced dynamics.				

	周次 Week	教学内容 Content	授课学时 Hours	教学方式 Format	授课教师 Instructor
*教学安排 Schedules	1-2	二体问题/Two-Body Problem	6	讲课	Masahiro Oghara
	3-4	三体问题/Three-Body Problem	6	讲课	Masahiro Oghara
	5	潮汐/Tides	3	讲课	Masahiro Oghara
	6	自转/Spin	3	讲课	Masahiro Oghara
	7	摄动函数/Disturbing Function	3	讲课	Masahiro Oghara
	8-9	共振/Resonance	6	讲课	Masahiro Oghara
	10-11	原始行星盘/Protoplanetary Disks	6	讲课	Masahiro Oghara
	12	星子的形成/Planetesimal Formation	3	讲课	Masahiro Oghara
	13	类地行星的形成/Terrestrial Planet Formation	3	讲课	Masahiro Oghara
	14	气体行星的形成/Giant Planet Formation	3	讲课	Masahiro Oghara
	15	行星系统的演化/Evolution of Planetary Systems	3	讲课	Masahiro Oghara
	16	综述/Review	3	讲课, 讨论	Masahiro Oghara
*考核方式 Grading Policy	在总分 100 分中, 30 分将分配给考勤, 70 分将分配给课程论文。 Out of 100 points, 30 points will be given for attendance and 70 points will be given for the essay.				
*教材或参考 资料 Textbooks & References	本课程内容将基于讲师所准备的材料。但学生们也可以自由参考以下教科书(无中文版) The lecture will be based on materials prepared by the instructor, but students may also refer to the following textbooks. - Solar System Dynamics, C. D. Murray and S. F. Dermott - Astrophysics of Planet Formation, P. J. Armitage				
备注 Notes					

备注说明:

1. 带*内容为必填项;
2. 课程简介字数为 300-500 字; 教学内容、进度安排等以表述清楚教学安排为宜, 字数不限。