Oxford Master Course in Mathematical and Theoretical Physics

From the academic year 2015/16, Oxford Physics and Oxford Mathematics will jointly offer a new masters level course in mathematical and theoretical physics (MMathPhys). If you are a physicist with a strong interest in the theoretical aspects of physics or a mathematician keen to learn about the application of mathematical methods to physical systems this course might be of interest to you. As an Oxford MPhys, MMath or MPhysPhil student, you will be able to apply for transfer to this course after your third year and study mathematical and theoretical physics in your fourth year, instead of following the fourth year of your original degree course.

The MMathPhys course provides a high-level, internationally competitive training in mathematical and theoretical physics, right up to the level of modern research. It covers the three main areas

- Theoretical Particle Physics/String Theory,
- Theoretical Condensed Matter Physics,
- Theoretical Astrophysics, Plasma Physics and Physics of Continuous Media.

MMathPhys students have to attend at least 10 units (with one unit corresponding to a 16-hour lecture course) worth of courses throughout the year. For an overview of the planned lecture courses, please turn over. The programme offers considerable flexibility so that students can design their own pathway. For example, you can aim for a broad theoretical education across subject areas or, alternatively, focus on one of the three subject areas above. Studies can be pursued with stronger emphasis on mathematical or on physical aspects.

As a MMathPhys students you will graduate as a **Master of Mathematical and Theoretical Physics** with a double classification, a BA degree class for the first three years of your study in your original subject and a MMathPhys degree class for your fourth year.

For more information, please visit http://www-thphys.physics.ox.ac.uk/MMathPhys.

MMathPhys, overview of lecture courses

Students have to attend at least 10 units, with one unit corresponding to a 16-hour lecture course, from the set of courses below. There is considerable freedom in the choice of courses and students will be able to design their own pathway through the programme. The table intends to give a general idea of the programme's content and represents the currently envisaged set of courses. Individual courses may change in the future in line with general curriculum development.

Overview of Lecture Courses			
	Theoretical Particle Physics	*Theoretical Condensed Matter Physics*	*Theor. Astrophysics, Plasma Physics & Physics of Continuous Media*
MT	**Quantum Field Theory** (24)		
		Statistical Mechanics$^{(MU:C6.2a)}$ (16)	
		Intro. Quant. CMP$^{(PU:C6)}$ (16)	
		Nonequilibrium Statistical Physics$^{(PU:C6)}$ (8)	
		Kinetic Theory (24)	
		Viscous Flow$^{(MU:B6a)}$ (16)	
	Gen. Relativity I$^{(MU:C7.2a)}$ (16)	⇐ ⇒	**Gen. Relativity I**$^{(MU:C7.2a)}$ (16)
	Perturbation Methods$^{(MU:C6.3a)}$ **(16)**		
	Scientific Computing I$^{(MG)}$ (12)		
	Numerical Solutions to Differential Equations I$^{(MU:B21a)}$ (16)		
	Numerical Linear Algebra$^{(MU:C12.1a)}$ (16)		
	Groups and Representations (24)		
	Algebraic Topology$^{(MU:C3.1a)}$ *(16)*		
	Algebraic Geometry$^{(MU:C3.4a)}$ *(16)*		
HT		Advanced Fluid Dynamics (16)	
		Soft Matter Physics (16)	
		Nonlinear Systems$^{(MU:B8b)}$ (16)	
	Advanced QFT (24)	*Quant. CMP II*$^{(PU:C6)}$ *(24)*	*Waves & Comp. Flow*$^{(MU:B6b)}$ *(16)*
	String Theory I$^{(MG)}$ *(16)*	*Networks*$^{(MU:C6.2b)}$ *(16)*	*Plasma Physics (16)*
	Supersymmetry & Sugra (24)		*Galactic & Planetary Dyn. (16)*
			Stellar Astrophysics$^{(PU:C1)}$ *(16)*
	Gen. Relativity II$^{(MU:C7.2b)}$ (16)	⇐ ⇒	Gen. Relativity II$^{(MU:C7.2b)}$ (16)
	Cosmology (16)	⇐ ⇒	Cosmology (16)
	Applied Complex Variables$^{(MU:C6.3b)}$ (16)		
	Scientific Computing II$^{(MG)}$ (12)		
	Numerical Solutions to Differential Equations II$^{(MU:B21b)}$ (16)		
	Differential Geometry (16)	⇐ ⇒	Differential Geometry (16)
	Geom. Group Th.$^{(MU:C3.2b)}$ *(16)*		
TT	Conformal Field Theory (16)		
	Introduction to Gauge-String Duality (16)		
		Topics in Soft & Active Matter Physics (8)	
		Complex Systems$^{(MG,*)}$ (16)	
	String Theory II$^{(MG,*)}$ *(16)*	*Advanced Quant. CMP (8)*	*Turbulence*$^{(*)}$ *(16)*
	The Standard Model (16)	*Topics in Quant. CMP (8)*	*Geophys. Fluid Dynamics (16)*
	Beyond the St. Model (16)	*Critical Phenomena*$^{(*)}$ *(16)*	*Advanced Plasma Physics (16)*
	Nonpert. Meth. in QFT (16)		*Astrophys. Fluid Dynamics (16)*
			High-Energy Astrophysics$^{(*)}$ *(16)*
	Astroparticle Phys.$^{(*)}$ (16)	⇐ ⇒	Astroparticle Phys.$^{(*)}$ (16)
	QFT in Curved Space$^{(*)}$ (16)	⇐ ⇒	QFT in Curved Space$^{(*)}$ (16)
	Dissertation, replacing one 16-hour lecture course		