**2010** 香港物理奧林匹克

Hong Kong Physics Olympiad 2010

Scope of the Competition 比賽範圍

The scope of the Hong Kong Physics Olympiad is mainly based on the HKCEE Physics Syllabus, but also includes the following topics:

香港物理奧林匹克的比賽範圍主要以中學會考物理課程爲基礎，亦會涉及以下範疇：

**Mechanics**力學

1. Application of Newton's second law of motion in two dimensions, projectile motion 牛頓運動第二定律在二維空間的應用、拋體運動
2. Application of Newton's second law of motion with constant rate of change of mass 牛頓運動第二定律在質量有匀速變化情況的應用
3. Uniform circular motion 匀速圓周運動
4. Gravity Force and Potential 萬有引力、引力勢
5. Hooke's Law 虎克定律
6. Density, buoyancy, pressure (solid and liquid) 密度、浮力、壓力(固體和液體)
7. Centre of mass 質心
8. Coefficient of friction, static friction and limiting friction 摩擦系數、靜摩擦、極限摩擦
9. Conservation of momentum in 2-D 二維空間的動量守恆
10. Equilibrium of coplanar forces 共面力的平衡

**Mechanics of Rigid Bodies** 剛體力學

1. Torque 轉矩 2. Balance of rigid bodies 剛體平衡

**Oscillations and waves** 振盪與波

1. Interference in thin film 薄膜干涉
2. Huygen's principle 惠更斯原理
3. Simple harmonic motion 簡諧振盪

**Electric Charge and Electric Field** 電荷與電場

1. Electric field strength and potential gradient 電場強度和電勢梯度
2. Internal resistance of power supply and meters 電源和電錶的內電阻
3. Force experienced by a charged particle in a uniform electric field($F = qE$) 匀電場中帶電粒子所受的力

**Current and Magnetic Field** 電流與電場

1. Lorentz force experienced by a moving charged particle in a uniform magnetic field($\boldsymbol{F} = q\boldsymbol{v}\times\boldsymbol{B}$) 移動中帶電粒子在匀磁場中所受的洛倫茲力
2. Electromagnetic induction, magnetic flux and Faraday's law of electromagnetic induction, magnetic field due to currents (e.g. solenoid, coil, straight line, etc). 電磁感應、磁通量與法拉第電磁感應定律、電流產生的磁場(例：螺線管、線圈、直導線等)
3. Magnetic field due to long straight wire, circular loop and long solenoid 載電流在長直導線、圓形線圈和長螺線管所產生的磁場
4. Kirchhoff's laws for Double-loop circuits 基爾霍夫定律在雙繞環電路的應用

**Optics**光學

1. Lens formula 透鏡公式
2. Optics include planar and curved mirrors 光學包括平面和曲面的反射鏡
3. Phase change during reflection 反射時的相位變化