Dear Colleagues:

The suggested topics of the Hong Kong Physics Olympiads are given below. The topics serve to provide the scope of the questions that might appear in the competition. We expect the students to have the basic knowledge and understanding of the topics, and the ability to solve related problems. The topics are to be studied in extra-curriculum activities for students with strong interest in physics and have demonstrated their ability to handle well the regular classes. Teachers have the discretion to decide the content of the extra-curriculum activities.

There are two categories of topics. One are the 'small step forward' of the topics covered extensively in S4-5, most of them by just adding simple math treatments, such as friction coefficient, lens formula, electric force, electromagnetic induction, etc., while others are more in-depth explorations, such as coplanar force and moment of force balance of a rigid body at rest. The other category is for 'new topics', such as circular motion, two-D motion, gas law, center of mass, etc., that are normally not in the S4-5 syllabus.

The Hong Kong Physics Olympiads topics, in addition to the S4-5 syllabus, include the following.

Category-1 (small step forward)

1. 摩擦系數、動摩擦、極限靜摩擦 (coefficient of friction, static friction and limiting friction)
2. 二維空間的動量守恆定律 (conservation of momentum in 2-D)
3. 轉矩 (torque)
4. 共面力的平衡狀態 (equilibrium of coplanar forces)
5. 勻電場中帶電粒子所受的電力(F = qE) (force experienced by a charged particle in a uniform electric field)
6. 移動中帶電粒子在勻磁場中所受的洛倫茲力(F = qv×B) (Lorentz force experienced by a moving charged particle in a uniform magnetic field)
7. Electromagnetic induction, magnetic flux and Faraday's law, magnetic field due to currents e.g. solenoid, coil, straight line, etc.
8. Electric field strength and potential gradient.
9. 電源和電錶的內電阻 (internal resistance of power supply and meters)
10. 透镜公式 lens formula

Category-2 (new)

1. 牛頓第二定律應用於二維空間, 拋體運動 (application of Newton's second in 2-D, projectile)
2. 牛頓第二定律應用於質量有匀速變化的情況 (application of Newton's second law with constant rate of change of mass)
3. 匀速率圓周運動 (uniform circular motion)
4. 弹性定律 Hooke's Law.
5. 密度,浮力,压力(固体,流体) Density, buoyancy, pressure (solid and liquid)
6. Magnetic field due to long straight wire, circular loop and long solenoid
7. 基爾霍夫定律於雙繞環電路 (Kirchhoff's laws for Double-loop circuits)
8. 質心 (centre of mass)
9. (optics)中是否包括平面、曲面的反射鏡？(plane, curved mirror?)
10. 反射時的相位變化 (phase change during reflection)
11. 薄膜干涉的干涉條件，不包括「數學方法處理疊加時的振幅」 (interference in thin film)
12. 惠更斯定律 (Huygen's principle)