

CaYPT 2021 Safety Guide for Teamleaders

This document outlines potential safety risks associated with the CaYPT problems. Please make sure that your students read over this document carefully and take precautions when they are working on these problems. This list can't possibly cover all the potential risks. Students should be advised to conduct these experiments under adult supervision if possible.

Problem A. Circling Magnets

- Button magnets may shatter on impact
- Strong magnets can be a pinching hazard
- Because we are essentially creating a short circuit here, the internal resistance of the battery will cause it to heat up. Depending on the battery type, this may cause explosions with the release of gas and electrolyte.
- Aluminum foil can be sharp and may cause cuts.

Problem B. Irreversible Cartesian Diver

- Test tube and other glassware can break and create sharp shards
- Pressure of the system can build up to a level that is unsafe. There should be precaution taken to ensure that the experimental apparatus is pressure rated and that the pressure can be equalized safely.

Problem C. Bead Dynamics

- Bead may fly out and cause injury.
- Parts of the fast spinning hoop can may also detach and cause injury

Problem D. Spin Drift

- No obvious safety concern with performing the experiment, but depending on the particular setup, there may be additional risks.

Problem E. Wilberforce Pendulum

- The pendulum can be made to move fast
- Spring wire can store a lot of energy and can spring back incredibly quickly. This can cause eye injury.

Problem F. Wind Speed

Selected: Yes

- The coil can get very hot
- Student should be careful when working with high voltage/current

Problem G. Guitar String

- Strong magnets can be a pinching hazard
- Electromagnets can get hot after continuous operation
- Thin strings can be sharp and cause cuts

Problem H. Dynamic Hydrophobicity

- Fast moving surface can cause mechanical injuries
- Splashing liquid drops can cause short circuit
- Proper safety precautions should be taken depending on the liquid used

Problem I. Rebounding Capsule

- No obvious safety concern with performing the experiment, but depending on the particular setup, there may be additional risks.

Problem J. Hand Helicopter

- Fast spinning rotor blades can cause mechanical injuries.