**Murder Methods**

* Projectile problem
* Tesla Coil
* Rail gun
* Concrete apple
* Solenoid; Magnetic decapitation
* Foucault Pendulum
* Radiation
* Capacitor
* Particle Accelerator
  + Maybe include cyclotron
* Harmonic Oscillator; Hooke law problem

**Characters**

* Albert Einstein
* Marie Curie
* Niels Bohr
* Rosalind Franklin
* Richard Feynman
* Cecilia Payne
* Vera Rubin
* Sir Isaac Newton
* Nikola Tesla
* Heisenberg
* Henry Norris Russell
* Stephen Hawking
* James Clerk Maxwell
* Michael Faraday
* Ernest Rutherford
* Paul Dirac
* Edwin Hubble
* Galileo Galilei
* Annie Jump Cannon
* Chien-Shiung Wu
* Erwin Schrodinger
* Max Planck
* Ernest Rutherford

**Prologue**

You, a lowly graduate student, have been invited to the annual Physics Social at Minkowski Manor. The social is regularly frequented by some of the largest names in physics and astronomy. Minkowski Manor is a large and luxurious two story mansion. A heavy storm is brewing and in fact a downpour has already begun. However, the Physics Social is one of the largest events of the year and the **(host)** regularly brags about the safety of the residence.

Upon entering, you shed your rain soaked coat and are quickly greeted by **(friend1)** and Werner Heisenberg. They offer you a drink and you move into the Grand Lounge with your two comrades. The nights festivities begin but you have a feeling tonight’s Physics Social will be very different from any other….

**Story Start**

You’ve had **(random number between 1 and 10)** and swaying to the soft music of a record player playing in the background. **(host)** has called everyone into the Grand Lounge for a toast before dinner. Standing in the doorway leading to the Foyer **(host)** gives a toast to the recent observations of the LIGO detector and to the continued successes of his fellow physicists. **He/She** also explains that the band has cancelled because of the storm, so the after dinner dancing will have to be to the music of the record player. As your host continues on with a well-rehearsed speech, you lean in to tell Heisenberg a dirty joke when lightning strikes just outside the Dining Room window shaking the whole house with deafening thunder. The power goes out and several screams are heard throughout the house along with various other noises you can’t identify.

The power comes back on and everyone in the Grand Lounge is shocked to see **(GLmv)** lying on the floor motionless with a small arrow in their back. You are stunned and **(host)** quickly yells to the Butler the butler to call for an ambulance and the police for a murder has occurred. **(host)** tells everyone to remain calm as panic slowly starts to creep in among the party guests.

Just as everyone starts to calm down, to the extent they are capable of anyways after all a murder had just happened right in front of them, Butler the butler returns to relay the news that the phones are down. The valet then drives the final nail in the coffin by telling everyone in the Grand Lounge that the road to the manor has been blocked by trees and that the small bridge has collapsed due to the raging waters caused by the downpour. Panic ensues and people are starting to look at each other with suspecting eyes. After a few moments of this, **(host)** finally gets everyone to calm down and says that the only option they have is to split into groups and search the house for the murderer.

Slowly the eerie truth that they are stuck in the mansion at least until morning starts to sink into the minds of the party goers including yourself. After finishing the rest of your drink, you decide that you will use the knowledge you have obtained so far in your physics career to solve this murder so that no one else comes to harm. People break into groups and start to search the house but it is obvious most are in shock and will end up sitting in another room trying to collect themselves.

**1st floor**

**Grand Lounge Murder**

* Victim has been killed by a crossbow.
* Upon inspection of body give player:
  + Identity
  + Direction victim was facing
  + Where the victim was shot exactly (height from ground) **(var1 which will be related to the height attribute)**
* Upon inspection of room player sees:
  + Fireplace
    - Player notices the fire is burning bright; maybe **(guest4)** saw something since was standing near it
  + Large bookshelf with nic-nacs near the entrance to the dining room
    - Tennis trophy
      * Just a crummy tennis trophy
    - Pictures of **(hosts)**’s prized racing horses
      * Upon inspection find the small crossbow lying behind them
      * On it is a note that says “The projectile velocity of this bow is **(var2)** and the mass of the bolt is **(var3)**. I fired with the crossbow level to my shoulders. How tall am I? Assume the distance from shoulders to top of my head is 25cm.
  + Painting of **(host)**
    - you appreciate the fine brush strokes
  + **(guest1)**
    - Drinking heavily
    - Off putting and angry about being stuck with here
    - In slurring words tells you to leave them alone
  + **(guest2)**
    - Standing near the right side of the entrance to the dining room
    - Heard a snap from his right hand side near the book shelf
  + **(guest3)**
    - Breathing heavily; if watch is true then fiddling the watch
    - Doesn’t recall anything other than a scream coming from the direction of the foyer
  + **(guest4)**
    - Saw the silhouette of a person in the doorway of the dining room but lightning blinded him then the person was gone
  + **(guest5)**
  + Heisenberg
  + **(friend1)**
    - Says they will stay put to try and calm people down and will lay a sheet on the body once you finish inspecting it
    - Tells Heisenberg to accompany and help you
  + **(host)**
    - Appears oddly untroubled by the murder but does appear flustered by something
    - Will excuse himself to the kitchen to check on food for his guests so that hopefully it will help calm them
* **Solution**
  + 1st solve for t using t=d/v
  + 2nd solve for y initial using delta y = -1/2 g t ^2

**Nook Murder**

* Victim has been decapitated
* There is a bloody bar stuck in the wall
* Upon inspection of body:
  + Identity
  + Notice decapitation but head is missing
* Inspect physics experiment
  + Notice large “U” shaped wire
  + Notice Voltage source and switch
  + Inspect switch
    - Switch appears to be able to be flipped remotely
  + The equipment appears to be sitting on top of sets of coils that generate a magnetic field that points up straight through the U shaped wire
  + If the switch was thrown a current would be generated that is counter clockwise if there was a wire, or conductor, connected across the U shaped wire
  + You measure the width of the U shaped wire to be **(var1)**
  + You also notice the voltage source has been set to **(var2)**
  + Doing some quick calculations you find out that the coils generate a magnetic field of **(var3)**
* Inspect window
  + Window is unlocked
* Inspect desk
  + **(nmv)** appear to have been nosing through **(host)**’s lab notebooks
  + **(nmv)** was trying to steal **(host)**’s notebook detailing how to unify gravity with the other forces
  + You also see the lab notes on the “rail gun”
    - In it you see that a metal bar is used to connect the circuit across the U shaped wire
    - In it you find the following equation:
      * , where V is the voltage of the voltage source, B is the field due to the coils, W is the width of the U shaped wire, and v the final velocity of the bar if the rail gun is fired
* Inspect dog statue
  + Just a crummy dog statue but you pet its head anyway
  + Notice a note taped to the statue
    - Note says “It seems **(nmv)** nosiness caused her to lose her head…literally. Calculate the final velocity of the bar that caused **(nmv)** to meet their demise. The answer (in SI units) will be a code you need.”
      * Code is for a small hand safe found in Guest Bed Room 3.

**Dining Room**

* Inspect Table
  + There are delicious looking Hors d'oeuvres.
  + The table has already been set with very nice china.
* Look out window
  + You see that the lightning struck the tree outside.
* Cupboard to the right side of the entrance to the Grand Lounge
  + Upon inspection discover some type of remote control device
    - Press the button
      * Nothing happens
    - Flip the switch
      * Power is cut to the building
      * You quickly flip it back on
    - Inspect device
      * Find a note in the battery case
        + Note says: “This RF transmitter helped me conduct a little experiment earlier tonight. Off the top of my head I can’t recall the results though… Anyways a slightly shorter wavelength may
* Admire the chandelier above the table.
  + It’s a very nice chandelier.
* Inspect large cupboard full of fine china and such
  + The host appears to have used the nicest of their china for tonight’s event.

**Kitchen**

* Inspect freezer
  + Some kind of Thermodynamics problem needs to be solved
* Inspect stove
* Inspect microwave
  + Find head of **(nmv)**
* Inspect island

**Storage Room**

* Inspect shelf 1
  + Lots of food and cooking items
* Inspect shelf 2
  + Some seasonings and assorted herbs/spices
* Inspect shelf 3
  + Lots of Pots and Pans
* Inspect shelf 4
  + Find a duffel bag hidden behind the shelf that contains **(murderer personal item)**

**Ball Room**

* Inspect Music Stage area
  + Chairs are set up for the musicians but there is no equipment nor muscisians
* Inspect Bar
  + Make yourself a drink
  + Talk with **(guest6)**
    - Was very close friends with **(GLMV)**
    - Before murder says that someone should cut **(guest8)** off they have been drinking more and more ever since **(GLMV)** was killed
    - After murder of **(BRMV)** says you need to talk to **(guest7)** and **(guest8)** because they may have saw something
* **(guest7)**
  + won’t have much to say before the ball room murder
* **(guest8)**
  + drinking heavily before the ball room murder b/c was close friends with **(GLMV)**
* Conditional murder
* **(BRMV)** gets pushed from the Ball Room overlook on the 2nd floor when you find and open the small safe in Guest Bedroom 3
* **(guest7)**
  + says they saw someone push **(BRMV)** over the handrail
* **(guest8)**
  + says they saw **(BRMV)** jump over the handrail to their death
* Inspect body
  + Identity
  + Notice that the victim is laying face up
    - Must have fallen over the rail backwards

**Servant Quarters**

* Find Butler the butler shaken and disturbed. In all his long years of service to **(host)** he has never experienced anything like this.
* Ask for info about the murderer
  + Says there has been some strange things happening over the last couple days. The power has shut off a few times.

**1st floor hallway**

**1st floor restroom**

**Foyer**

**2nd Floor**

**Grand Staircase**

**Guest Bath 1**

**Guest Bath 2**

**Bedroom Hallway**

**Guest Bed 1**

**Guest Bed 2**

**Guest Bed 3**

* small hand safe in room

**Guest Bed 4**

**Master Bedroom**

**Master Bath**

**Ball Room Overlook**

**Foyer Overlook**

**Library**