

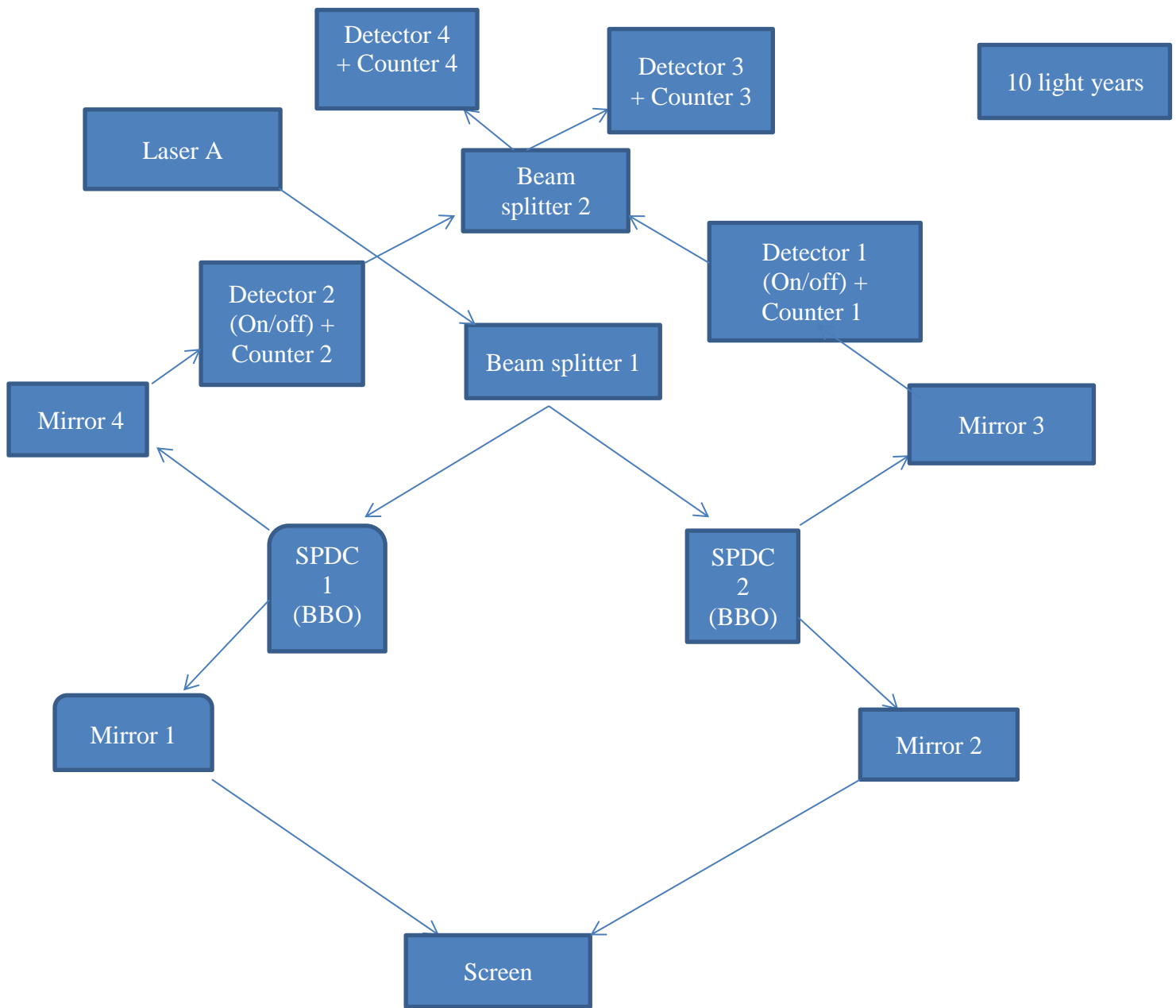
## Appendix A

Gadanken experience, instantaneous communication from afar.

Principles:

- A) Measuring "which way information" i.e. knowing which path did a photon take causes the interferometry pattern made by this photon to collapse in a non-local manner, i.e. at infinite speed.
- B) We can send the information to a far distance.
- C) We can measure the information from a far distance causing the interferometry pattern to collapse.
- D) We can erase the information (using a 'quantum eraser, Scully and Druhill time delay eraser experiment, Ephraim Steinberg quantum eraser experiment), causing the interferometry pattern to reappear.
- E) We can choose, from a far distance, if we want to erase the information or measure it, causing interferometry patterns to appear or disappear from a far distance.
- F) Of course, we can call the appearance of an interferometry pattern 1, and the appearance of no interferometry pattern 0, and data has been transferred.

Description of the experiment:



Course of experiment:

- A) Laser A shines photons 1 every 10 seconds, during 10,000 seconds.
- B) Photons reach Beam splitter 1.
- C) The photon's wave function splits and reaches SPDC 1 or 2
- D) One photon continues on its course to mirror 1 or 2 and the other is sent to Mirror 3 or Mirror 4.
- E) Ghost photon passes Detector 1 or Detector 2. If both detectors are closed, it continues to Beam splitter 2.

- F) Beam splitter 2 acts as a quantum eraser sending the photons to either Detector 3 or Detector 4 in an even chance. If the photons are detected by Detector 3 or Detector 4, we cannot know which path did the photon choose, and "which way information" has been erased.
- G) After all the 1000 "ghost photons" sent to the quantum eraser reach Detector 3 or Detector 4, the 1000 photons sent from the BBO reach the screen. Since we can't know which path each photon took, an interference pattern should be shown on the screen.
- H) In case we decide to turn on Detectors 1 and 2, we will know which course each photon chose.
- I) After all "ghost" photons are measured by detectors 1 or 2, photons arrive to the screen. (We can set the course of ghost photons to be detected or erased before photons reach screen).
- J) Since we know which path each photon chose, no interferometry pattern will appear on the screen.

In this experiment, detectors 1 and 2 acted as far distance transmitters, transmitting information at light years distance. Since we can choose any distance to set these transmitters, this means the information was passed at infinite speed.