# Why HAB

High Altitude Ballooning is all about sending up a payload (containing tracking equipment and often sensors and/or cameras) to a high altitude. Typical flights get to 30km or so (about 100,000 feet), with the balloon expanding from a typical 1 metre or so diameter at ground level to 8 metres or so at altitude, where the latex gives way and the payload falls by parachute to the ground.

So, why do it? Probably you have your own answers already otherwise you wouldn’t be on this course! For me, I’ve been interested in space since watching a murky grey image of Neil Armstrong stepping onto the moon. Also, I’m a keen photographer, and this gives me my only chance of taking photos of Earth from high enough to see the “thin blue line” of the atmosphere. Images from HAB flights can be just as impressive as many of those taken from the ISS, but of course for a tiny fraction of the price!

HAB isn’t complicated but it does cover a lot of fields (and not just the ones you hope the flight will land in!). Take your choice of STEM subjects from …

* Software
  + Reading GPS data
  + Reading sensors
  + Transmitting to radio
* Electronics
* Radio
  + Electromagnetic spectrum
  + Line of sight
  + Modulation of carrier wave
* The atmosphere
  + How temperature varies with altitude
  + Temperature Inversion
  + How air density/pressure varies with altitude
  + Different layers in the atmosphere
* Winds and weather forecasting
  + Use of weather balloons in forecasting
* Physics
  + Elasticity and why the balloon bursts
  + Altitude at which the balloon bursts
  + Wind resistance vs balloon size and air density
  + Descent rate vs parachute size, payload weight, air density

plus there are many activities, such as project planning, fund-raising, setting up a web site to show progress and results, setting up live streaming from the launch site, and editing a final video of the flight.