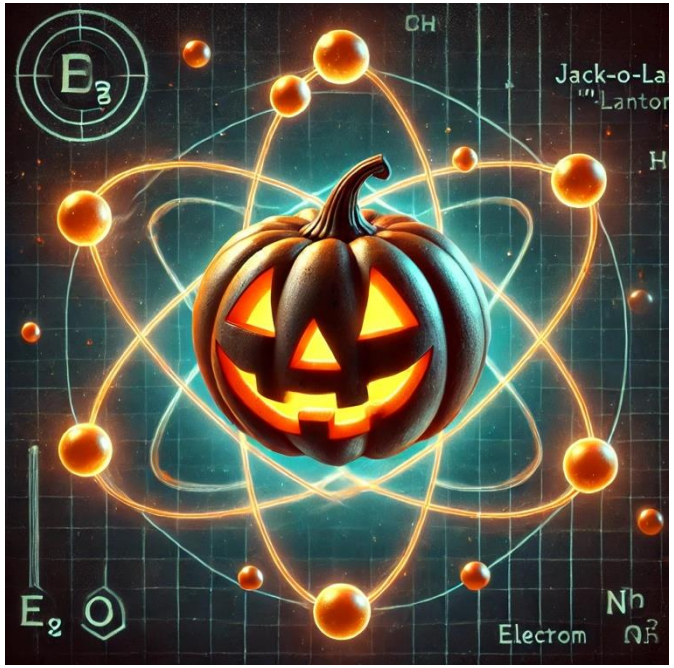

Dr. RbQ
Or: How I Learned to Stop
Worrying and Love Atoms

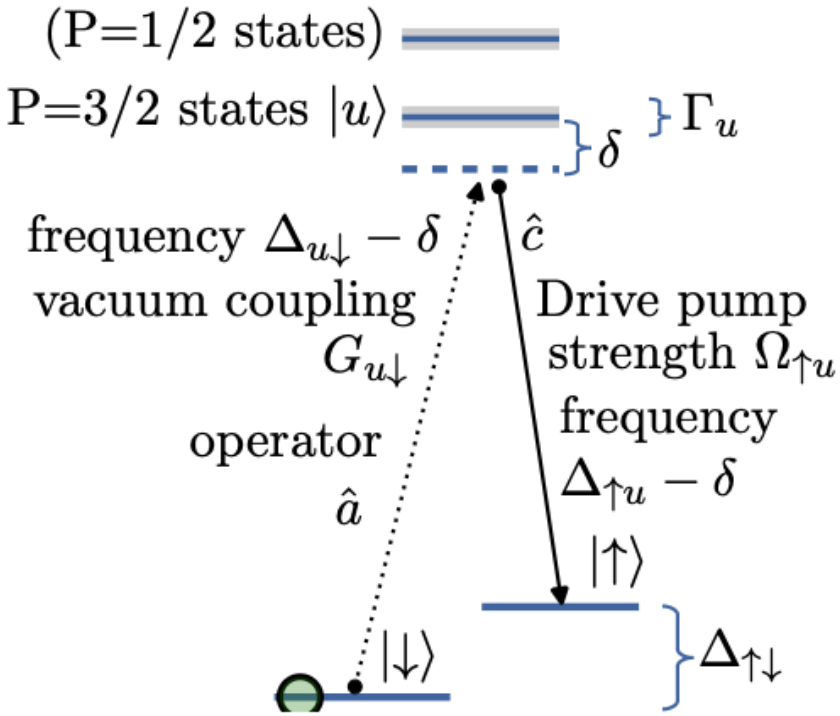
What can atoms do for us?

- State Injection
- Multiplexing Lorentzian Filtering and easier measurement
- Quantum Memory
- Better Filtering



How?

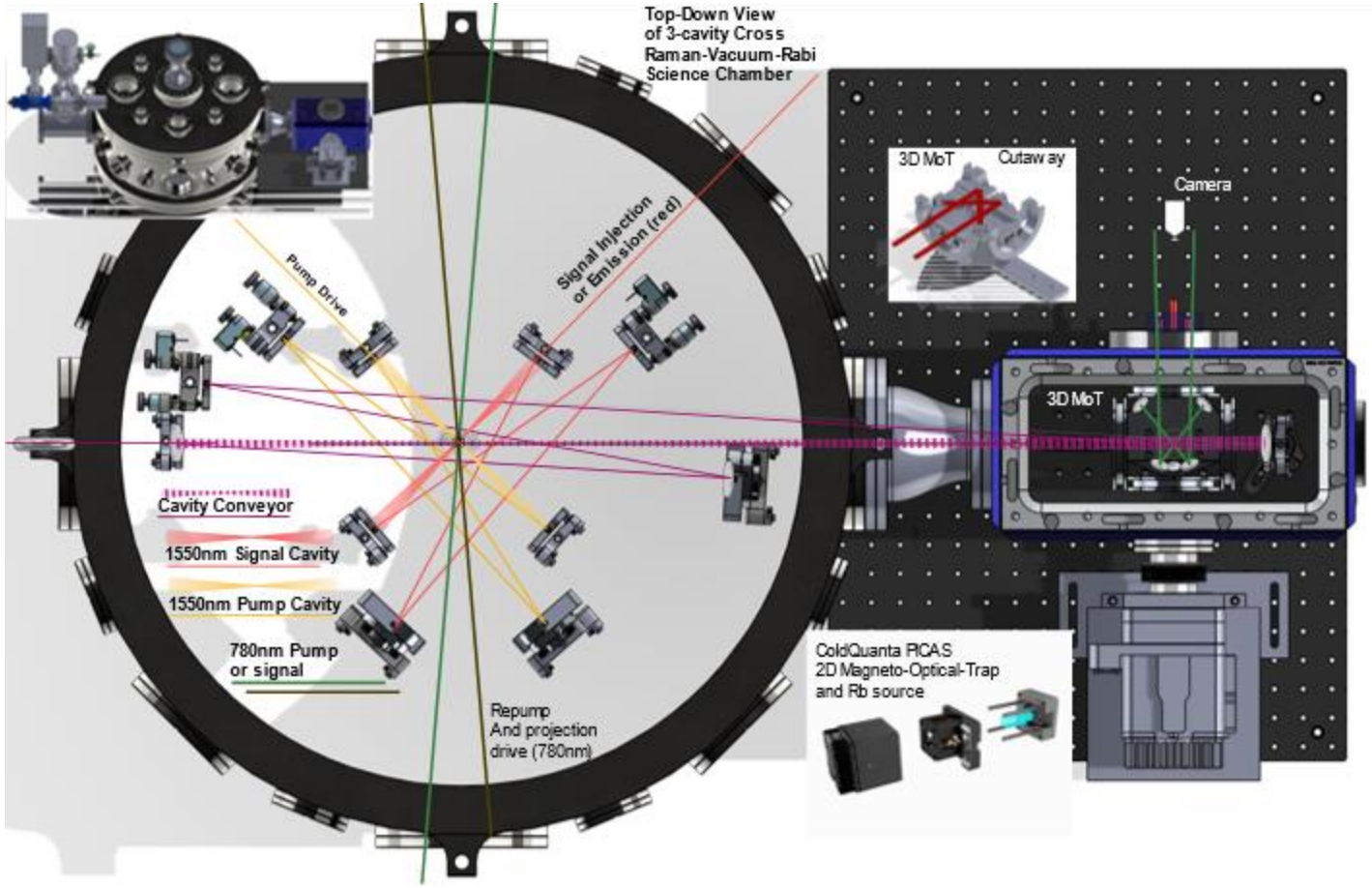
- Raman Transitions



Why cavities?

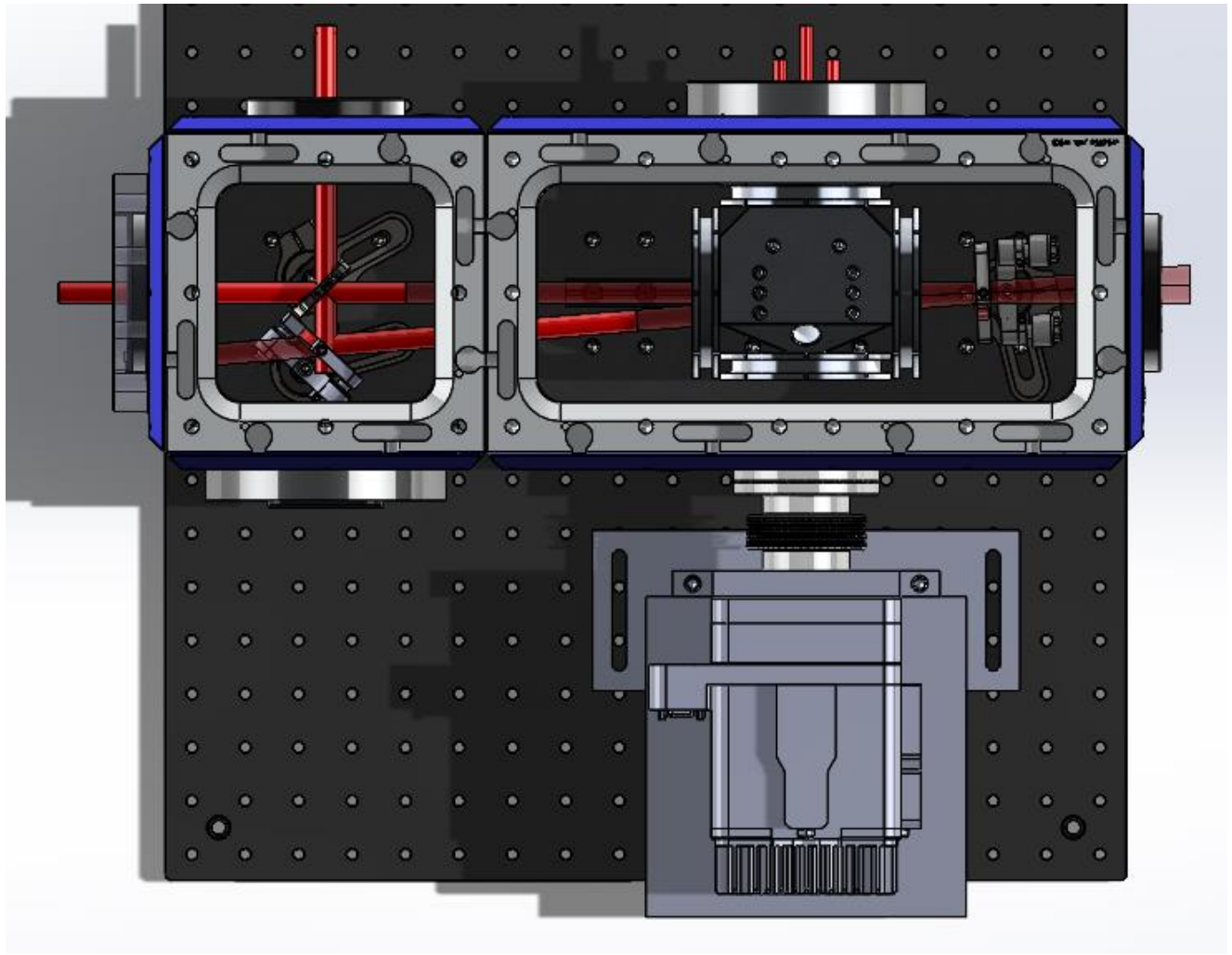
- More interactions with interferometer output
- Higher pump power
- Can make standing waves

The final plan



Intermediate Steps

- Demonstrate 3D MOT
- Demonstrate Dipole Trap Conveyer



What we’re working on now

- Cavity Design
- Vacuum Chamber Procurement
- Building the Demonstrator

Atomic Cooling Basics

- Dipole Trap
  - Basic idea: oscillating field induces as oscillating dipole in the atom, which interacts with the oscillating field
  - Use red-detuned light to focus our atoms towards the intensity maximum
  - Cannot cool atoms
- Magneto-Optical Trap (MOT)
  - Use (circularly polarized) red-detuned light to cool atoms
  - Magnetic Field Gradient provides Zeeman shift to favor trapping at the location of no magnetic field