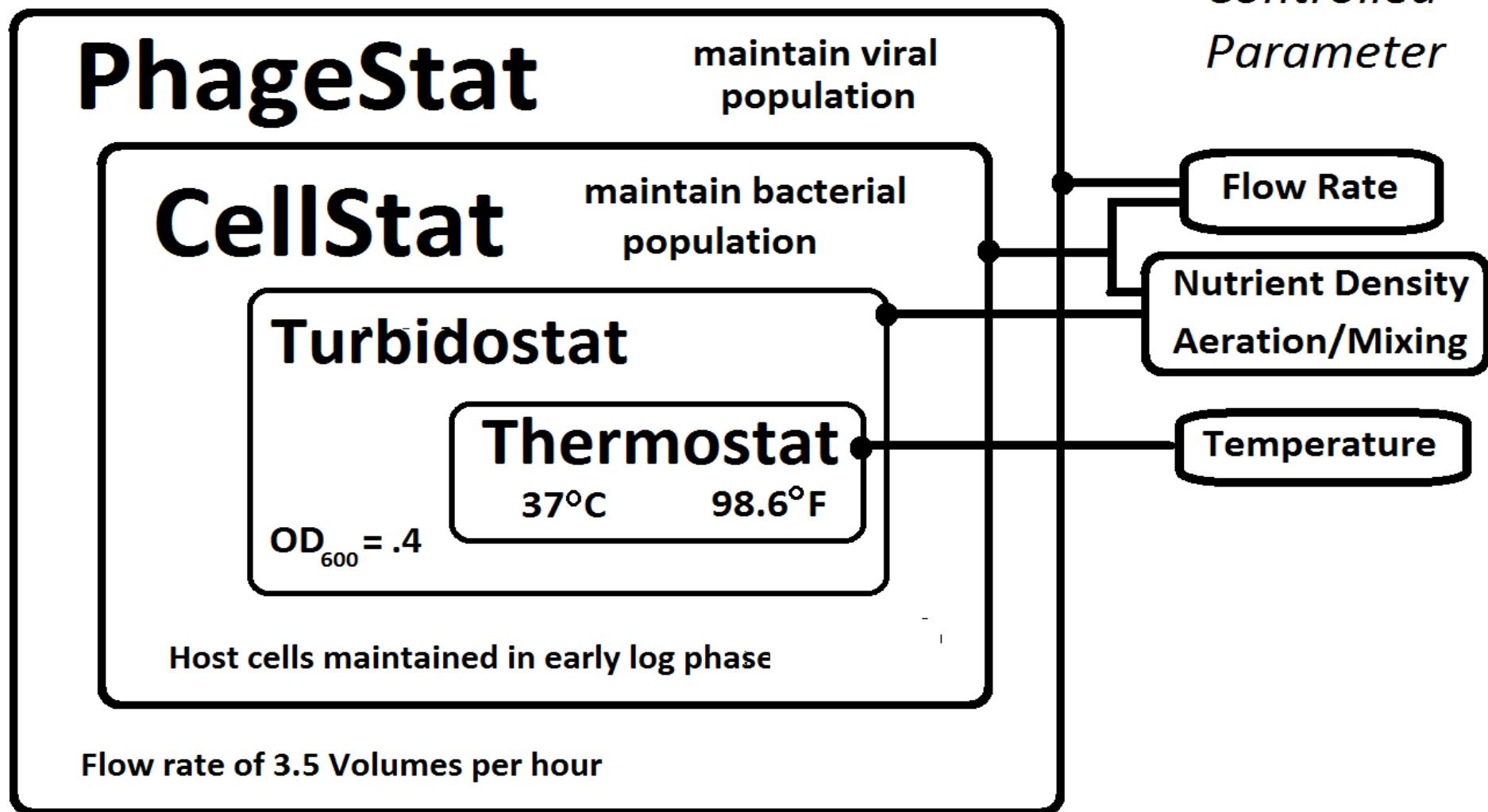
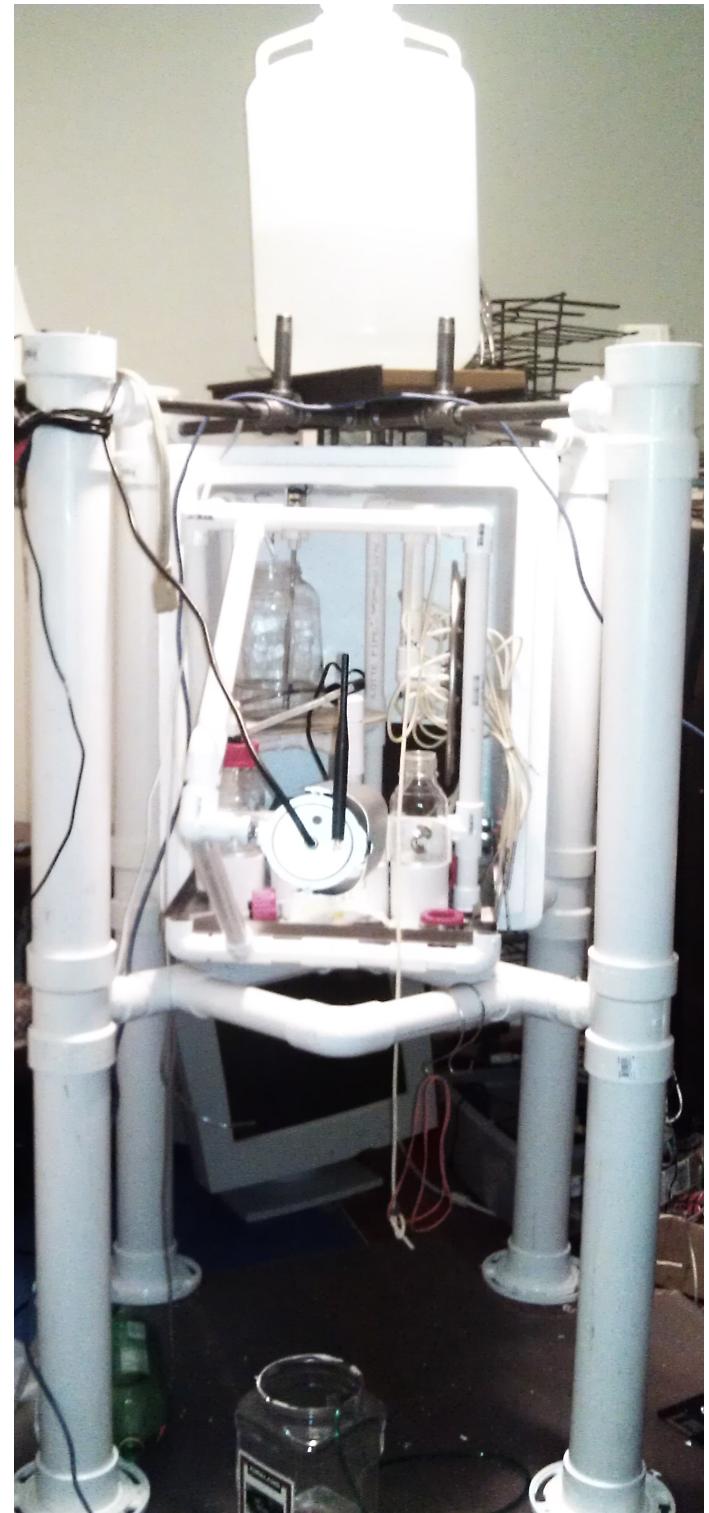


What has Reintjes been up to?



Am I Crazy?



My Goals

Do interesting work, even if it doesn't pay

Build an inexpensive, reliable, self-calibrating phagestat (virusstat) system

Address specific needs/failures we've had:

- *Peristaltic pump tubing failure*
 - *Temperature control*
 - *Lack of on-site personnel*
- *Avoid combining high-voltages + liquids*
 - *Failures of various 'black boxes'*
(e.g. commercial products with no schematics, code, warranty or service agreements)

Features

Many derive from a camera + image processing

1. Non-contact turbidity and temperature sensors
2. Non-contact level sensing
3. Custom magnetic stirrers
4. Bio-luminescence detection
5. Fold-able stainless aeration sparger ring
6. Network control and communication
7. Low impact sample collector
8. Inexpensive and easy to repair

Features

Many derive from a camera + image processing

1. Non-contact turbidity and temperature sensors eliminating the need for autoclave/sterilization of probe and bio-film problems.
2. Non-contact level sensing providing feedback for a simplified liquid flow system
3. Custom magnetic stirrers (I didn't **want** to do this) allowing optimal visual placement of host cell vessel and lagoons **and** computer control of spin-up spin-down to recover from stalling
4. Optical image integration for **bio-luminescence detection** replacing high-voltage (black box) spectrophotometer.
5. **Foldable stainless aeration sparger ring** to fit through narrow vessel neck yet lay flat around the bottom diameter, directing the bubble flow to help scrub the vessel walls.

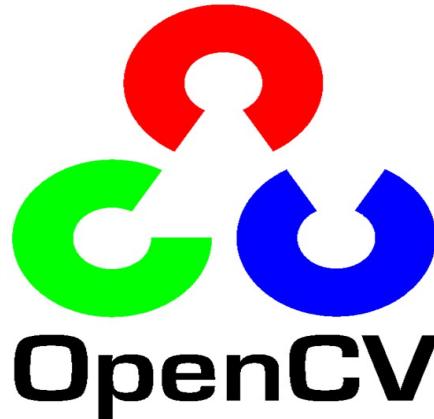
Features (continued)

- **Networked phagestat** sends text messages and images to report leaks, temperature or turbidity fluctuations, and bioluminescence spikes which may indicate evolutionary traction.
- Integrated (low impact) quad sample collector
- Other color indicators (not fluorescent or luminescent) could be used for properties or activities such as pH or phage population before pIII production.
 - Incremental material **cost of each additional phagestat:**

\$1000 (*labor not included*)

Phagestatus

- Documentation is in the form of a patent application but may be more useful as a trade secret. I am willing to present the entire project as open-source hardware (Publicity vs. VC money?)
- Needs debugging, software development, additional 3D-printed parts (months, not years, it could be limping along in a few weeks).
- Suggests an alternate business model providing 'Phagestat Service' to customers who will create their own AP, MP, and SP plasmids and competent cells.



Am I Crazy?



Python

C

Prolog

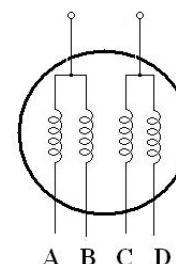
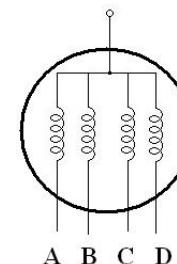
SMS

ABS

Linux

Raspberry Pi

ULN2003 PVC



Six-wire stepper (on the right) is the same as Five-wire stepper after we connect the two "common" leads at the top together