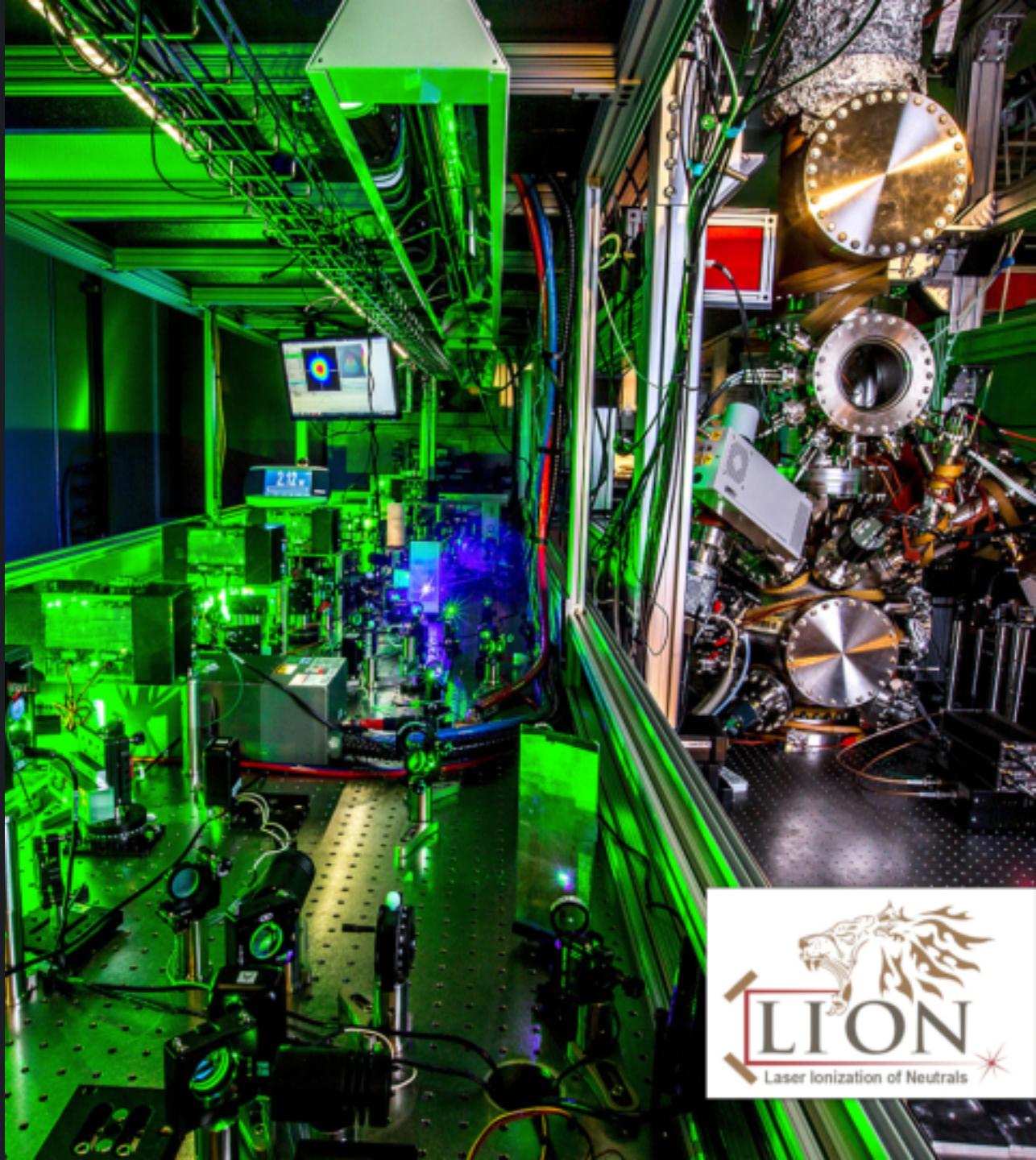


Packaging Python CLIs and GUIs for air-gapped computers

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Why should we care?

- Home-built instruments require home-built software
- Python has a great ecosystem
 - Instrument control
 - Data analysis
- But: Instrument computers are often air-gapped to run outdated software
- We can't just `pip install` dependencies!



The human aspect

- Yes, dependency installation can be done offline but it's tricky
- Updates require lots of manual work
- The user needs to understand the python issues in detail
- Overall, it's just not a good situation

Photo by Elliot Wilkinson on Unsplash



Some possible solutions

- PyInstaller:
 - Works well, but can be tricky
- py2exe:
 - Windows only (so no!)
- PyOxidizer:
 - Looked promising
 - No longer maintained
- fbs - a wrapper around PyInstaller:
 - **Not open source**
 - Works well for GUIs, creates installers
 - Is it still maintained?



PyApp - A new solution to an old problem

- A wrapper for python packages that bootstrap themselves at runtime
- Package a project locally or directly from PyPi
- Uses `indygreg`'s highly-reproducible builds for standalone python
- Example: Python project manager `hatch` is packaged via PyApp (both developed by Ofek Lev)



And what does the user see?

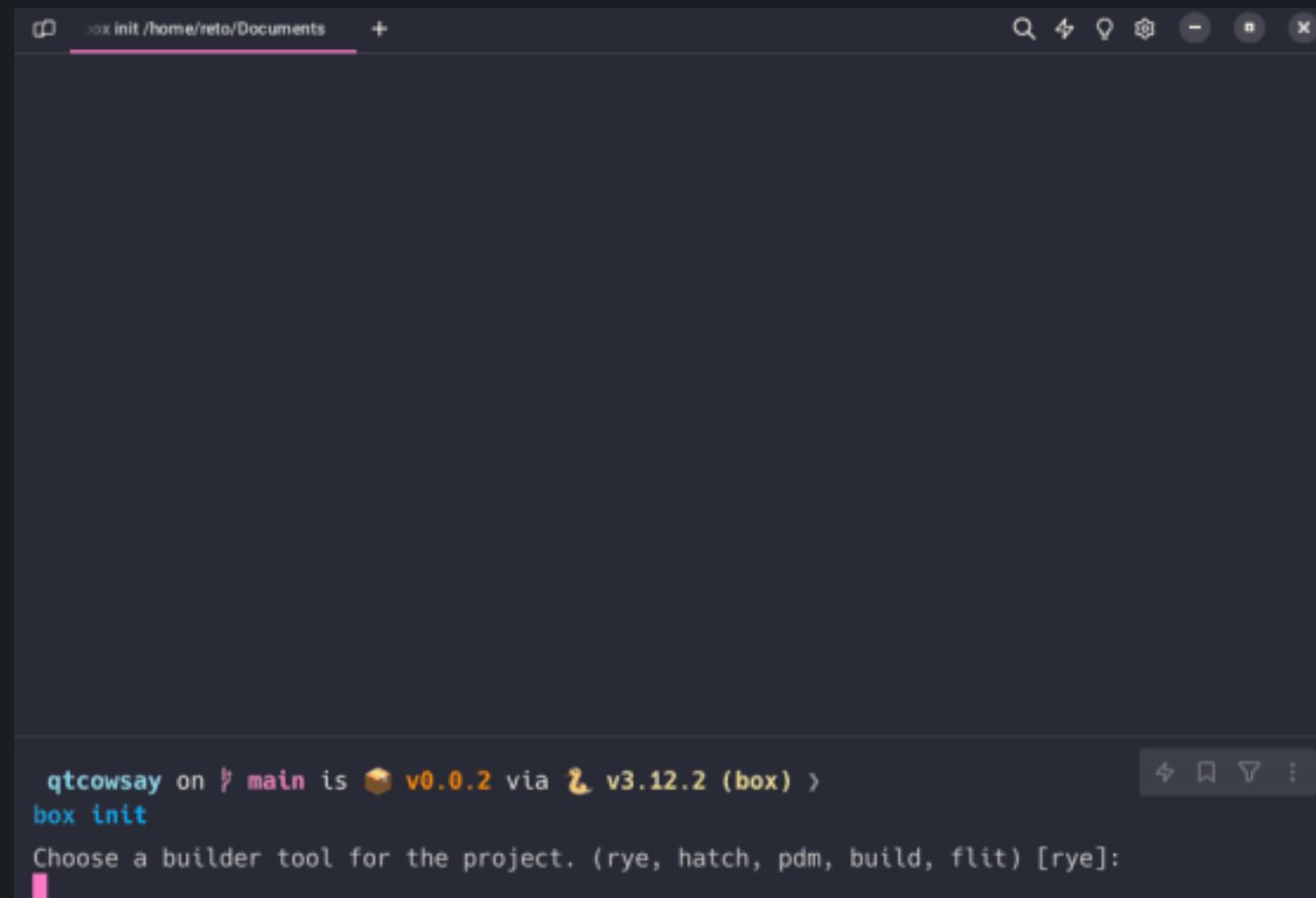
> |

But you mentioned air-gapped machine in the title!

- We can provide a standalone python build with all dependencies pre-installed!
- PyApp environment variables allow us to skip installation via `pip` upon first run
- Thus, no internet connection is required for the user!
- My own notes on this: [this GitHub gist](#)

box ing your apps

- Configure your app inside `pyproject.toml`
- Environment agnostic
- Package with PyApp for CLIs or GUIs
- Create installers for Linux, Windows, and MacOS
- Runs on GitHub actions
- **NOT** production ready!



A screenshot of a terminal window titled "box init /home/reto/Documents". The window has a dark theme with light-colored text. The title bar shows the path "box init /home/reto/Documents". The terminal content is as follows:

```
qtcowsay on ❯ main is 🐸 v0.0.2 via 🐍 v3.12.2 (box) >
box init
Choose a builder tool for the project. (rye, hatch, pdm, build, flit) [rye]:
```

Questions?

- Where can I try all of this?
 - PyApp: [repo](#), [docs](#)
 - Box: [repo](#), [docs](#)
- You forgot [insert alternative here]!
 - Not actually a question ;)
 - Please let me know though!
- Where can I find all the links and slides?
 - <https://galactic-forensics.space>
- Can I test this? Yes please!
- Can I help? Yes please, let's talk!

