

for Rust in Space { a_grounded: Journey; }

Who Am I

- **myrrlyn (pronounced like the wizard)**
- **Satellite Software Engineer**
- **Space Dynamics Laboratory**
- **Used Rust since mid-2016**

What Do I Do

I build*, program, test, and operate* satellites

I have nothing to do with KubOS, but they're cool

*I shouldn't, but, we needed bodies and I was there

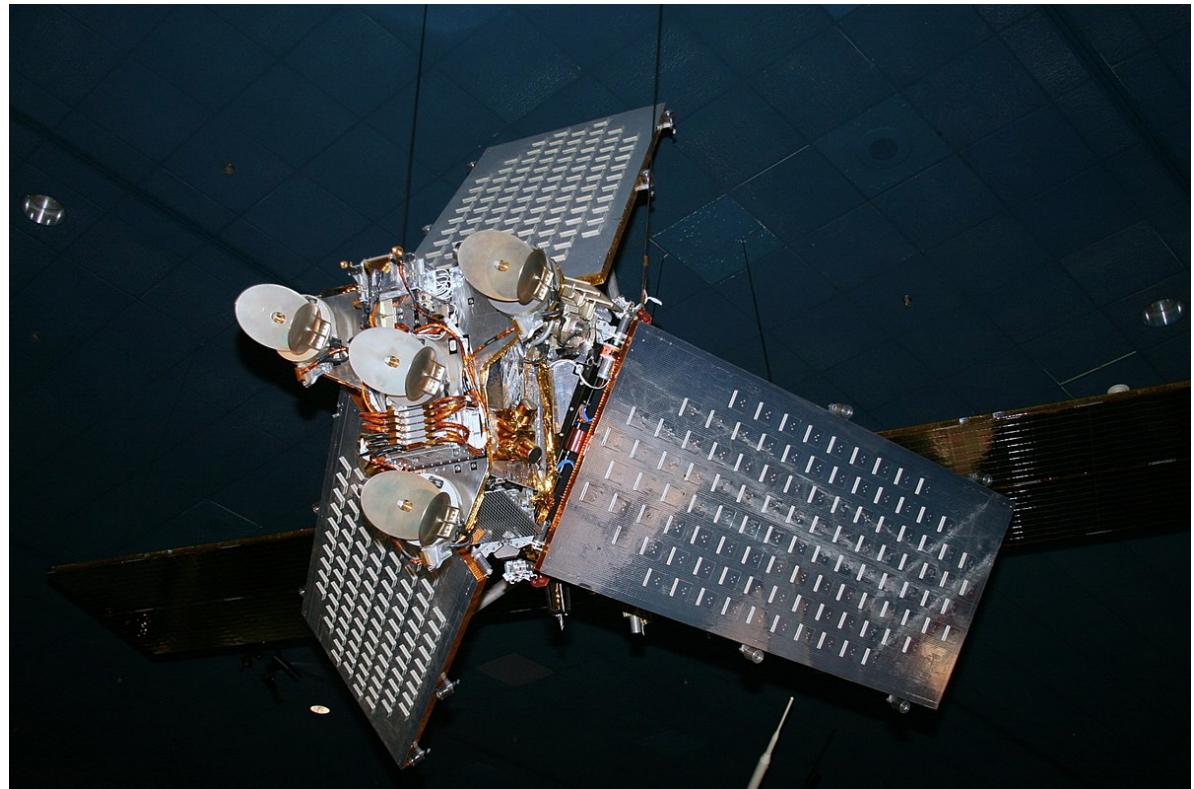
What Do I Do – Spoken Details

I helped work in the laboratory in large-scale assembly of one of my projects, and I served as mission operator for four months because the orbital schedule gave us contacts in a nine-hour window on a 23-hour period.

Everyone else was married and/or didn't want to slide their day around the clock. I was not married, and so took the role.

What Do I Do

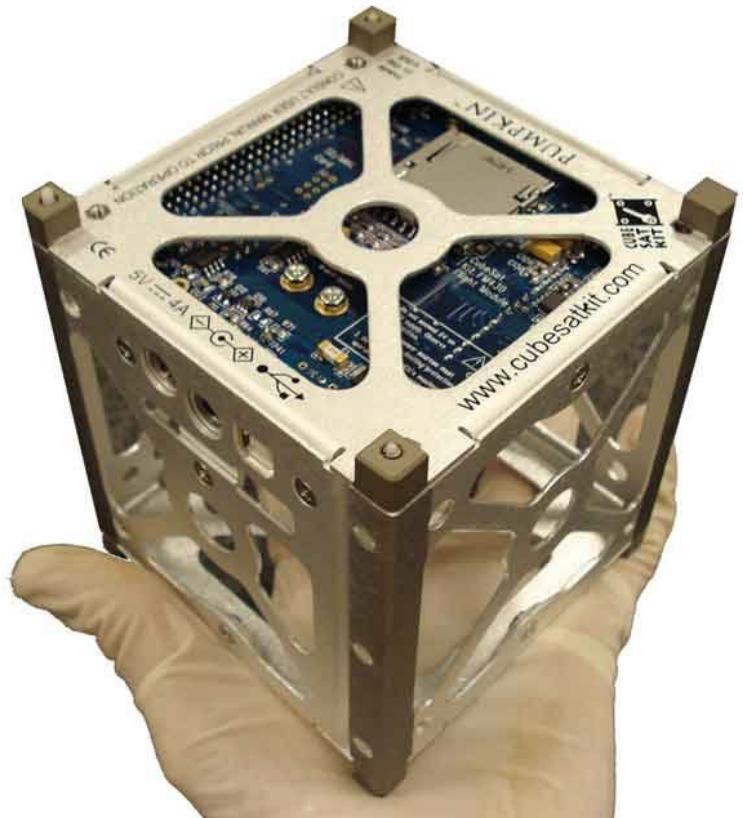
You know, satellites!



What Do I Do

Well, small satellites.

(also please don't do this)



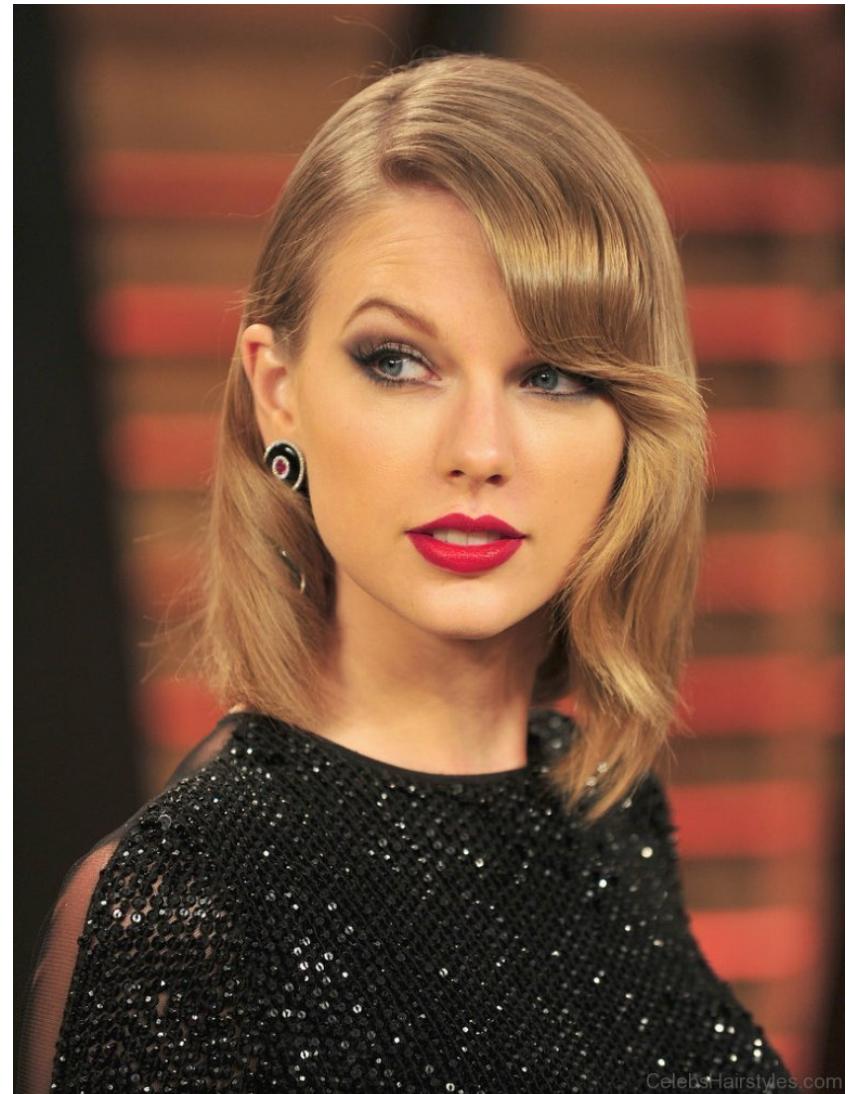
Swift in Space

I had some memory testing to do



Swift in Space

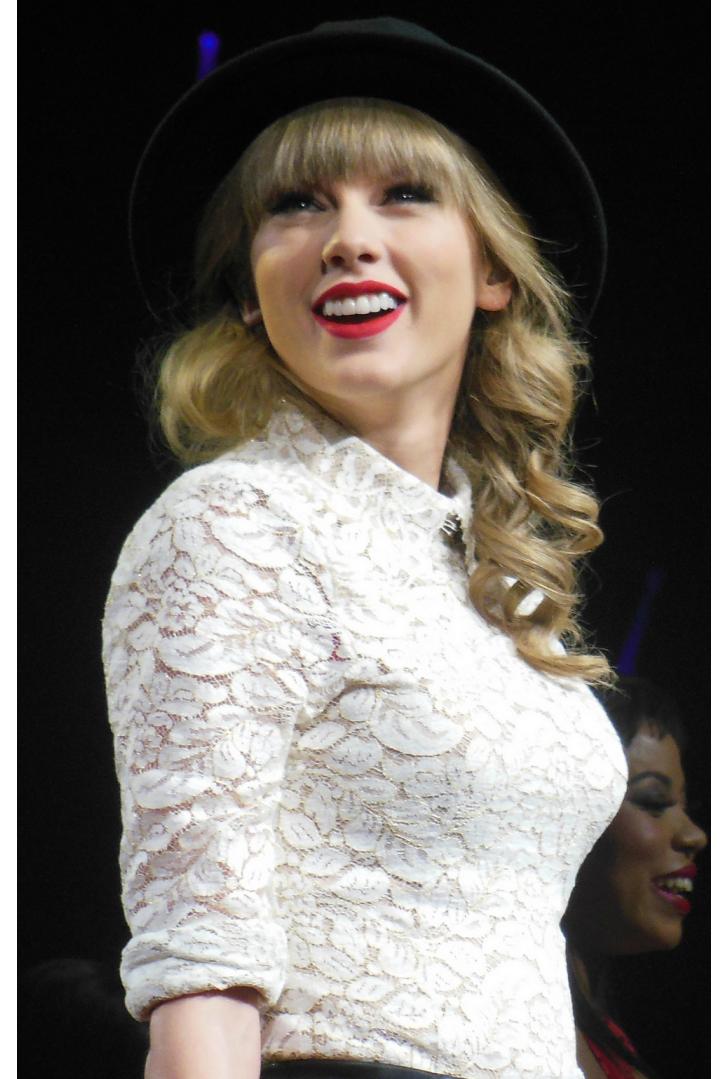
Wait, that was the wrong Swift



CelebsHairstyles.com

Swift in Space

There we go



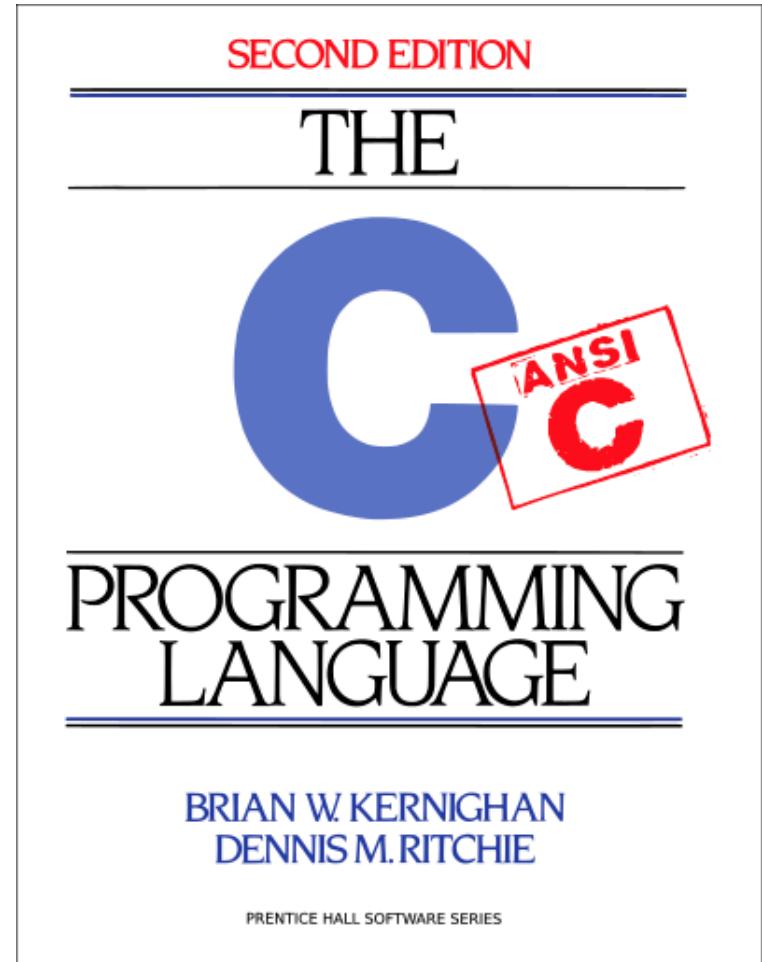
Swift in Space – Out-of-band Details

<https://twitter.com/myrrlyn/status/922615769703227392>

Follow me on Twitter; I'm the perfect mix of funny and cute.

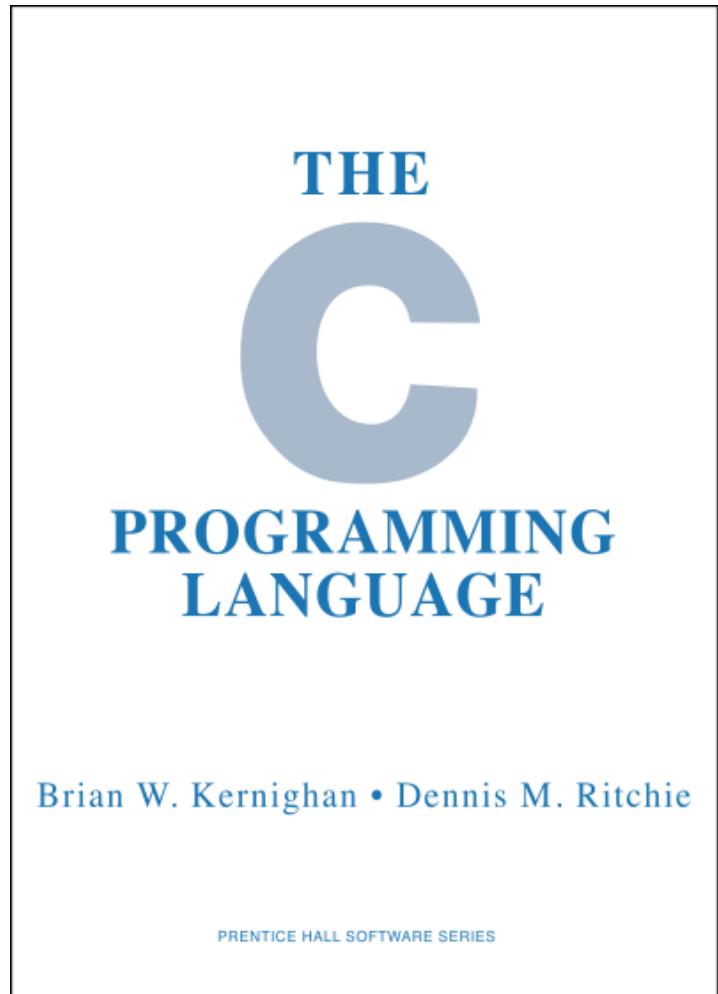
I Don't Write Rust at Work

I write C.



I Don't Write Rust at Work

I write the *bad* C. C89, pre-ANSI
(It's a compiler thing)



I Don't Write Rust at Work

I also write C++ 11 for on-orbit software

I write Ruby and Python for ground-station software.

Other people write C# and web applications. We use the whole stack! Lots of opportunities.

I Don't Write Rust at Work

But I want to!

Rust in Supporting Space

I wrote a kernel module in C89.

I *Rewrote It In Rust*. I found bugs.

I re-rewrote it in C, correctly.

Rust in Supporting Space

I wrote a network packet sniffer in Rust.

It took about a day.

It worked!

Fun Stats

22%

Fun Stats – Spoken Details

Percentage of CubeSats that are launched, and never turn on. Some are fatally damaged by the rocket. Some get jammed in the catapult. Some eject, but never activate. Some fail to deploy solar panels and run out of power.

22% fail at time zero. Another 8% fail in the first 6 months.

Space is hard, and CubeSats are small.

Cosmonaut

Background project (in Rust!)

Parses XML message definitions

Generates C++ code for flight

Web app for user terminal

Manages communication up to the ground radio

Cosmonaut

Barely exists

Is a learning project

Required to be open-source, but probably read-only :/

Conclusion

I haven't flown Rust (sorry!)

It's hugely empowered the C that I *have* delivered

It's made me a better programmer

Space Loves Safety!! We take that *very* seriously.

Rust has a place everywhere we work, and that's SO COOL.