

Article: Ten Simple Rules for the Open Development of Scientific Software

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[link to article](#)

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Introduction

Open source software

- ▶ Among the most cited publication
- ▶ High impact
- ▶ Wide user base

Projects such as

- ▶ Galaxy, Bio[Python | Perl | ...], EMBOSS, MetaVelvet, Taverna, Python, R

Ten rules

1. Don't reinvent the wheel
2. Code well
3. Be your own user
4. Be transparent
5. Be simple
6. Don't be a perfectionist
7. Nurture and grow your community
8. Promote your project
9. Find sponsors
10. Science counts

Don't reinvent the wheel

- ▶ Many algorithms and methods already implemented
 - ▶ Check if your problem has been solved
 - ▶ Break down your problem and check if parts have been solved
- ▶ If an open source project could be fitted to your problem, it might be a good idea to collaborate rather than re-implement.
- ▶ You can estimate if collaboration is appropriate by evaluating the source

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- ▶ Read code
- ▶ Improve open source code and send patches

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- ▶ READ CODE
- ▶ You learn a lot of tips and tricks by reading code, [BioPython](#) nice example

Be your own user

- ▶ Show your software can answer important and relevant questions in your field
- ▶ Should be simple for developers to use and integrate in their own research
- ▶ By doing this during development you avoid ending up with software that doesn't even meet your requirements

Be transparent

- ▶ Fear of getting scooped and bugs in pre-releases are valid concerns
- ▶ However being transparent can lead to
 - ▶ Founding or contribution to stake claim. Easier than redoing the whole project
 - ▶ Pre-release users know the code is not complete. Should review the code to make sure it does what they want. Leads to more eyes searching for bugs
- ▶ Therefore, better final product.
- ▶ Probably best known ways to be transparent: [GitHub](#) and [SourceForge](#)

Be simple

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- ▶ Using complex software for complex science is HARD!
- ▶ Make sure your software is as easy to set up as possible
- ▶ Make sure your software is as portable as possible
- ▶ Use standard way of packaging software.
- ▶ Stick to standard file formats.
- ▶ Everybody loves standards!
- ▶ Software which is simple to install is more likely to be tried out
- ▶ Documentation, sample code, sample data, test cases, video demonstrations. Make it simple, both for your potential users and for your sake

Don't be a perfectionist

- ▶ Release early, release often (attributed to Linus)
- ▶ Release when new features done. Users quickly identify bugs and request new features.
- ▶ It's better to have software now that solves some of your problems than to wait months for software that solves some more of your problems
- ▶ Think about using Agile development ([SCRUM](#)) for your work
- ▶ [Trello](#) is very nice online Agile board

Nurture and grow your community

- ▶ Give credit to the open source tools you use for your research
- ▶ Give credit for contributions to your open source software
- ▶ Get others involved in acting on feedback and contributions
- ▶ Try not to make changes to key aspects of your code such as APIs, file formats or command line options, people get annoyed

Promote your project

- ▶ If you want users, you need to advertise
 - ▶ Name your project, stick with it
 - ▶ Well organized, simple web page
 - ▶ Promote where potential users might lurk ([LinkedIn](#) [ResearchGate](#))
- ▶ Conferences are important, give presentations
- ▶ Ad-hoc?? meet-ups, hackathrons

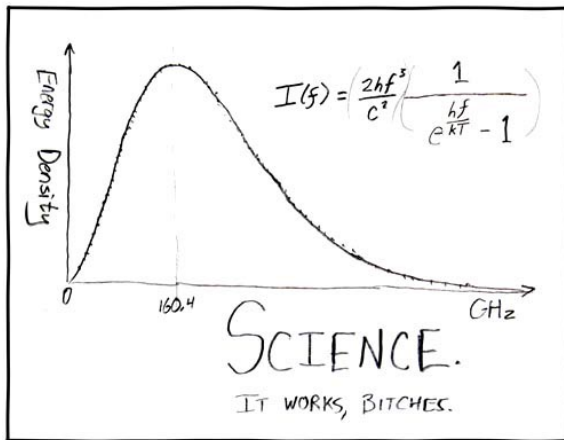
Find sponsors

- ▶ We can't work for free (for too long)
- ▶ Open development directly addresses the sustainability clause in many grant applications
- ▶ Open source not enough though, the community around the project needs to be the focus for long term success
- ▶ Any input on other ways to get sponsors??

Science counts

- ▶ Software to achieve scientific goals
- ▶ Becomes time sink when research over
- ▶ If done right, other people interested in furthering your process can take over
- ▶ Allows you to attack new frontiers knowing your software is in good hands

Science. It works



XKCD