Open source development and Rayleigh

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COMPUTATIONAL INFRASTRUCTURE for GEODYNAMICS

Reasons for open-source codes like Rayleigh

- Reduce duplication of efforts
- Use upstream improvements
- Community as force multiplier:
  - More diverse ideas
  - More eyes for the same problem
  - More robust testing
- Support the idea of open science, open data, open access
- Improve reproducibility
- Learn about new scientific and technical ideas
- Teach others what you know
- Meet future collaborators, employees, employers
- It's fun!

Ben Balter, Senior Product Manager at Github.com

Challenges for open-source projects

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- Acknowledgment of contributions
- Interactions between community and software architecture
  - Software architecture determines size of a community
  - Work on architecture is crucial, but not sufficiently acknowledged
- Tradeoffs between competing project goals
  - Performance vs flexibility, individual interests need to be balanced
- Lack of software development skills
- Community, Leadership and Governance
  - A software project needs growth both horizontally (user base) and vertically (hierarchy and user engagement) to prevent burnout of maintainers and maintain influx of new users
  - New users need to feel welcome and introduced to the community

Forming a community around Rayleigh

- Learn about how to modify the software
- Establish collaborations on short-term development tasks.
- Establish work flows for contributing to the repository.
- Establish a core-development team that is authorized to approve changes to the code moving forward.
- Establish long-term objectives for the continued development of Rayleigh.

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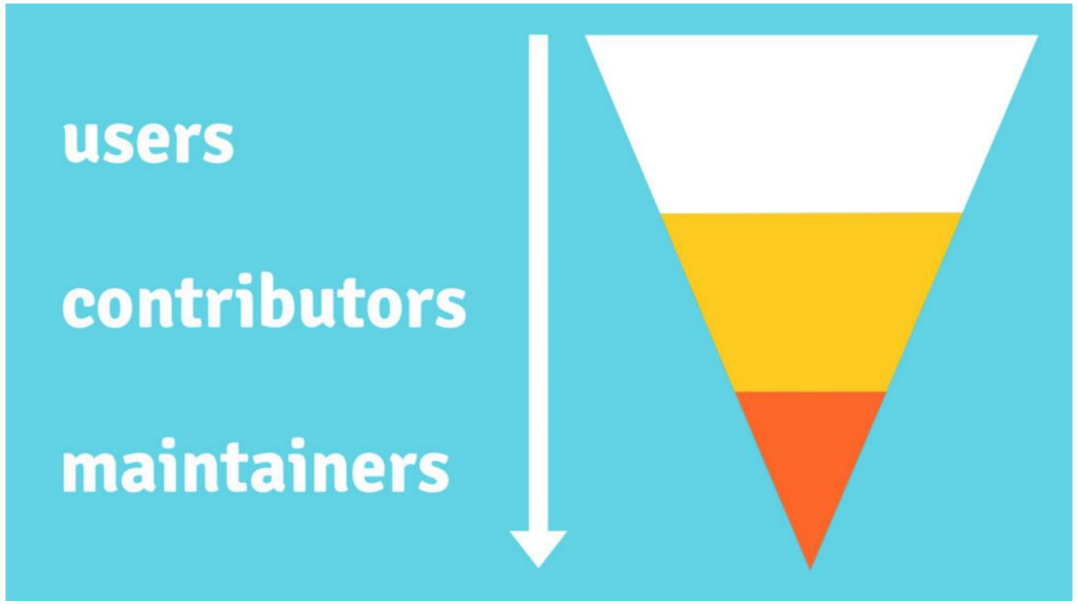
Forming a community around Rayleigh

- Get to know each other
- Create a place to discuss
- Share a common goal
- Form connections and capabilities
- Allow progress in responsibility



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How to get and give help

- Public discussions are better than private discussions (teaching, archival)
    - cig-geodyn@geodynamics.org
    - Github issues and pull requests (see Github tutorial later today)
- Follow a code of conduct, and be careful to create a welcoming community (I recommend reading: https://opensource.guide/building-community/)
- Create an atmosphere where it is not frightening to ask questions, and answering questions feels rewarding
- Adjust level of detail to the knowledge of the person contributing/asking, but teach to allow growth
- Create ways to acknowledge non-scientific (but crucial) development efforts:
    - E.g. set up an automatic newsletter or changelog that tells everyone who contributed something (I can help with that)
    - Create roles for people who help others (e.g. principal developer, core developer, …)