ALLEGHENY COLLEGE

A Computer Science Perspective on the Astronomy Software Research Process

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Disclaimers

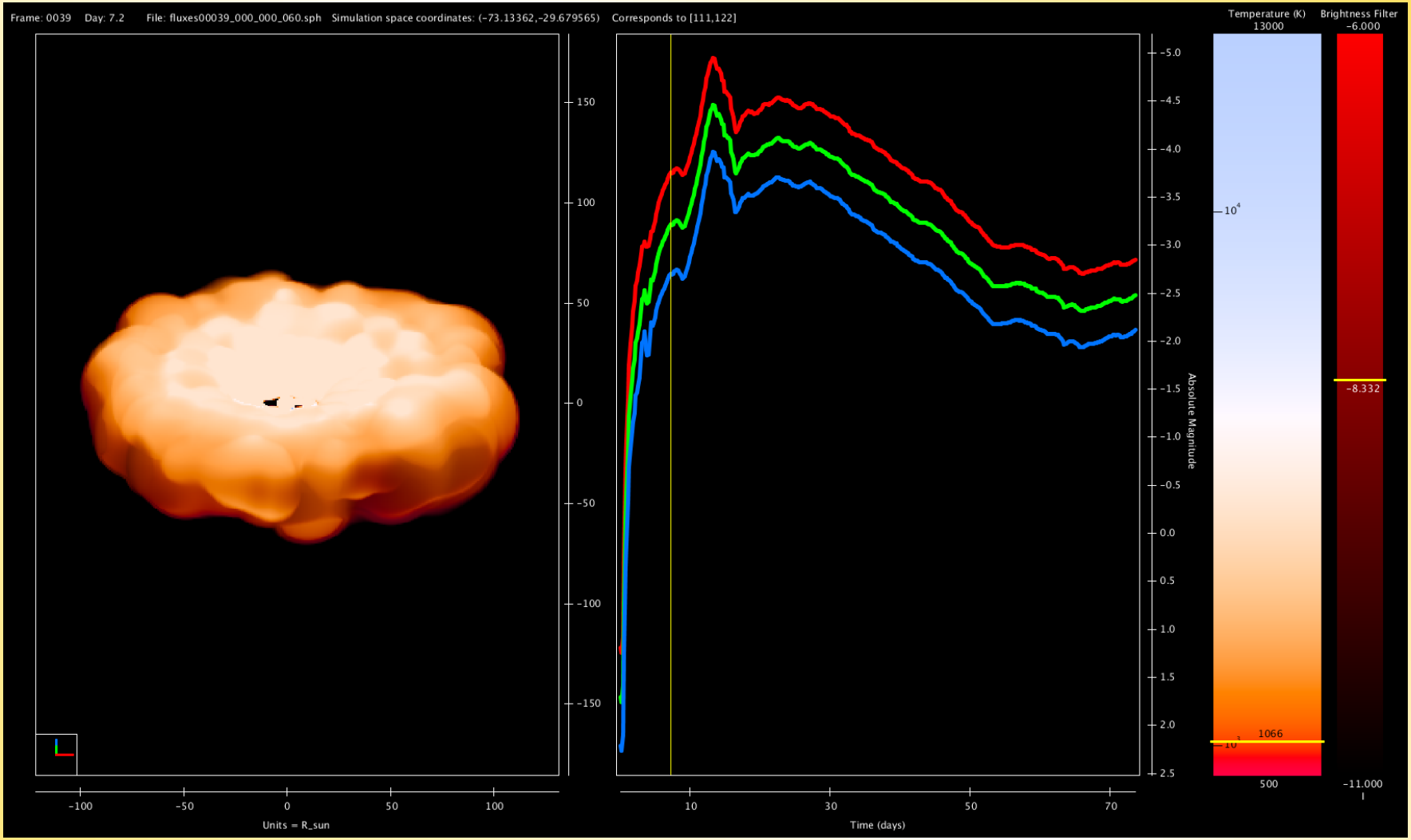
- I am not a professional software developer
- My experience with astronomy research software development is $n = 1$
- I don't speak for all computer scientists

The Collaboration

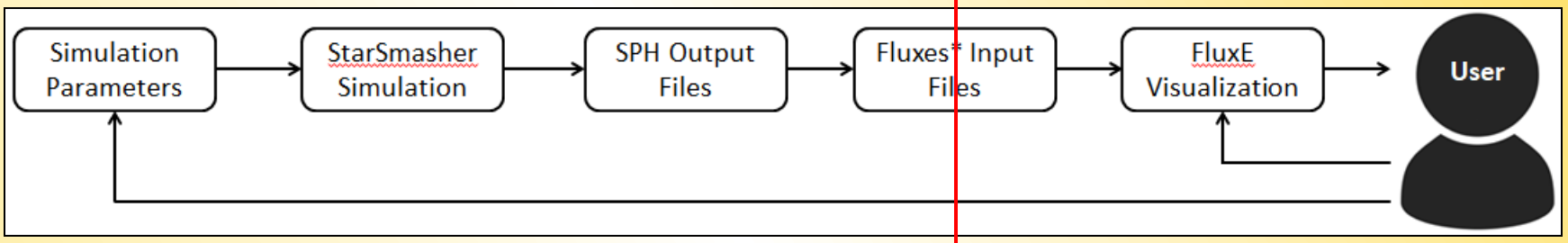
Jamie Lombardi
Allegheny College

Roger Hatfull
University of Alberta

FluxE: Flux Explorer



Lesson 1: Acknowledgment of Strengths

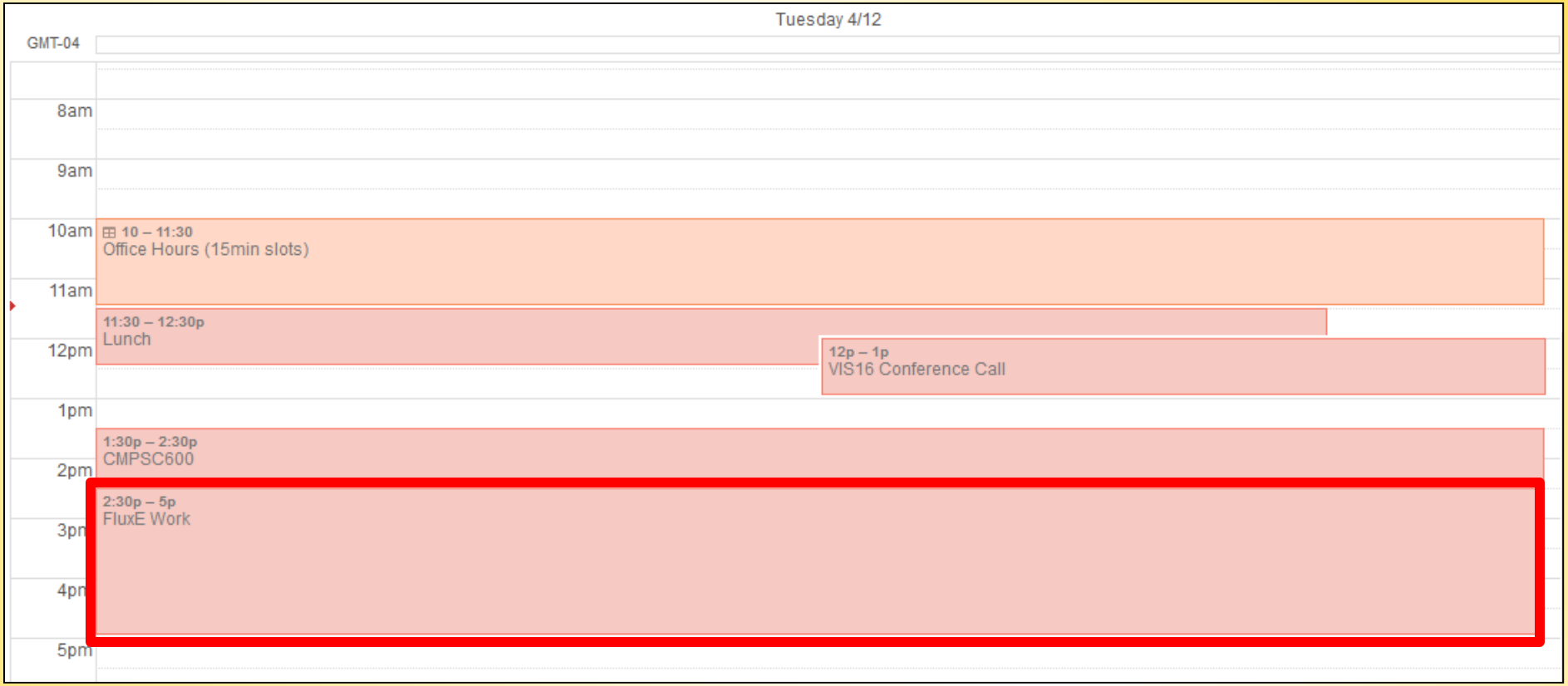


Lesson 2: Use Version Control, Commit Often

Credit: https://xkcd.com/1597/

John Wenskovit...	16d6229	More flexible config files (supports spaces, tabs, and comments)	2016-07-19
John Wenskovit...	a850133	Changed default behavior for single filter to show in color instead of greyscale	2016-07-17
James	725114a	fixed typo in helpExplanation[13]	2016-07-17
James	9250f64	fixed type in text printed out (32 should have been 3); suppressed detailed o...	2016-07-17
James	b122dc5	included loop%d at the beginning of the png filename to make it easier to ...	2016-07-14
John Wenskovit...	8de1658	Removing old deleted files	2016-07-14
James	d5917db	Did I commit an older version of fluxe.pde? Trying to recommit the new versi...	2016-07-13
James Lombardi	9ece6e7	Turn off the automatic goodSizing if the user starts to pan or zoom in the si...	2016-07-13
John Wenskovit...	937ef02	Ability to specify an exact number of times to loop through the simulation, a...	2016-07-13
John Wenskovit...	0cdf13e	Lighter blue shade	2016-07-13
John Wenskovit...	c9b3cfc	Improved efficiency of inView() to handle the different leftViewState options	2016-07-13
John Wenskovit...	91acafd	Committing `good sizing parameters' code after testing	2016-07-11
John Wenskovit...	e68baa3	Renders exponents properly	2016-07-08
John Wenskovit...	47ea47b	Fixed vertical line on light curve draw at first and last timestep	2016-07-07
John Wenskovit...	f4952c4	Added some new config parameters and info in README	2016-07-07
John Wenskovit...	21a525c	Updated README and default parameters	2016-07-07
John Wenskovit...	3e18cab	Simple render parameter in the config file	2016-07-06
John Wenskovit...	ec47a01	Adding simple render mode	2016-07-06
John Wenskovit...	f6e1509	New config parameter to run through the animation only once	2016-07-05
John Wenskovit...	aa087e0	Improved magnitude precision	2016-07-01

Lesson 3: Frequent Communication



Lesson 4: Manage Feature Requests

18. [DONE] If the user clicks on the red color bar, it should be the same as hitting the 1 key. If the user clicks on the green color bar, it's the same as hitting 2 key. Finally, clicking on blue color bar is the same as hitting the 3 key.
19. [DONE] Light curves! The light curves could be displayed in their entirety, with the data point corresponding to the currently displayed frame being emphasized. The easiest way to do this would involve adding a little extra information to the fluxes* files. The user could be given the option of displaying or not displaying the light curve.
20. [DONE] As the simulation plays, a vertical bar shows where the current frame corresponds to in the light curve.
21. [DONE] Clicking on a region in the light curve jumps the simulation to the closest timestep to the click location. (And pauses the animation?)
22. [DONE] Check mouse cursor position if user taps the letter "T". If the mouse is over one of the color bars on the right, then use the flux density information from that filter to dim the displayed temperature information. If the mouse cursor is not over top of a color bar when "T" is hit, then display all available temperature data without regard for the flux density in any filter (this is the original behavior of the code when the T button was hit). (The explanation of "T" on the help screen may need to be extended a little to explain briefly this functionality.)
23. [DONE] If temperature data are being displayed with flux densities being used for the intensity, then there can be two color bars to the right: one for temperature and one for flux density. If the user mouses over the image, there will be a horizontal yellow bar on each of these color bars. The color of the color bar (red, green, blue, or grayscale) should be whatever color that flux density's color bar was on the main screen when temperature was not being shown: that will help the user to remember which filter is being used.
24. [DONE] Don't bother showing first color bar if FILTER_ONE_INDEX=-1. Don't bother showing second color bar if FILTER_TWO_INDEX=-1. Don't bother showing third color bar if FILTER_THREE_INDEX=-1. Please leave the color bars at the width they currently

Lesson 5: Collaborate with an Expert

- I've worked with:
  - Computer Scientists (HPC, DB, and HCI)
  - Nurses
  - Computational Biologists
  - Molecular Biologists
  - Statisticians
  - Mechanical Engineers
  - Linguists
  - Artists
  - Astronomers

Summary

1. Acknowledgment of Strengths
2. Version Control
   a. Use It
   b. Commit Often
3. Frequent Communication
4. Manage Feature Requests
5. Collaborate with an Expert