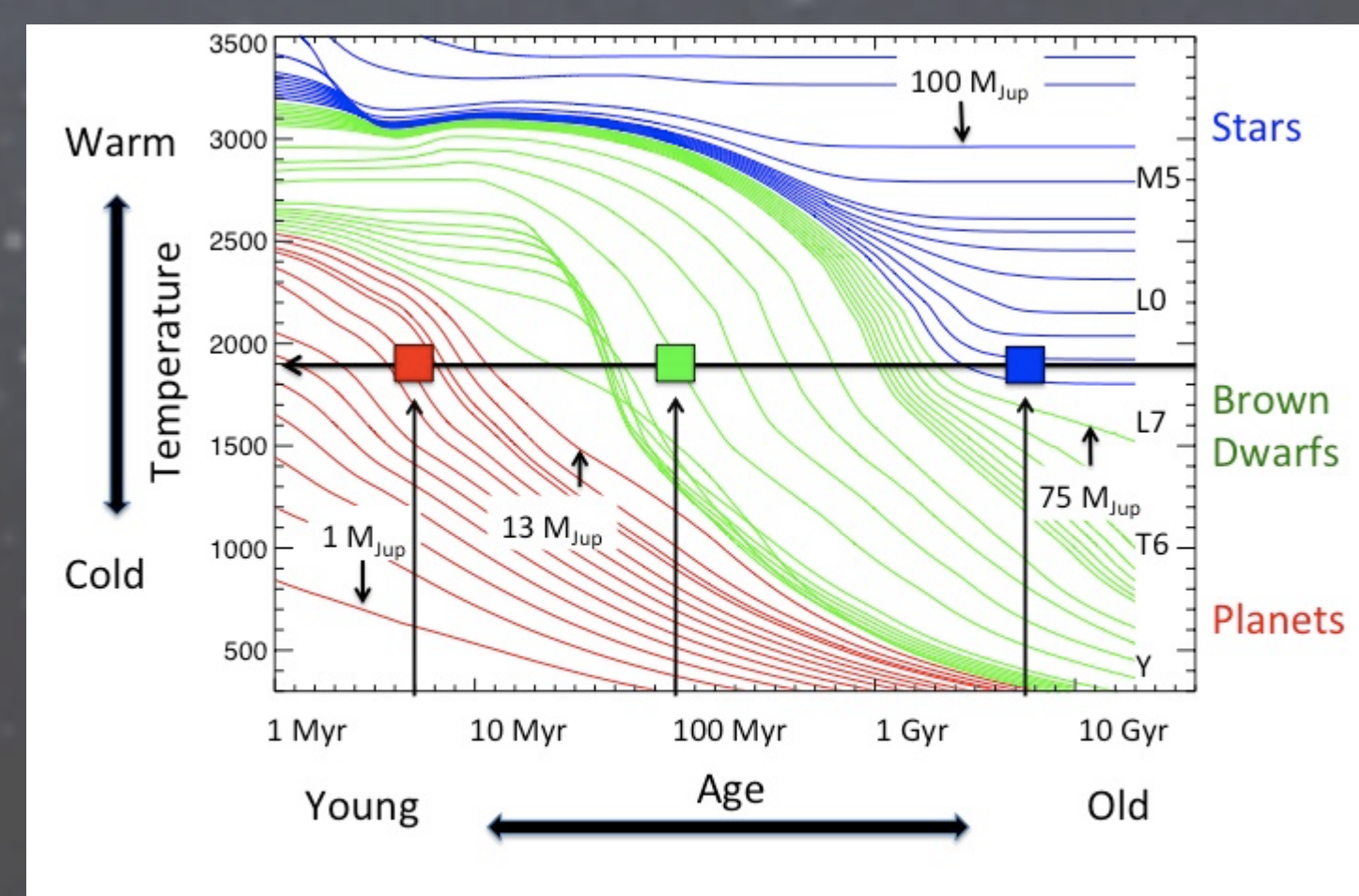


Updating Fundamental Parameters of Brown Dwarfs With Gaia

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What is a Brown Dwarf?



- Brown Dwarfs are objects too massive to be a planet yet too small to fuse hydrogen as stars do.
- While stars cool as they get older and maintain their temperature after a certain age, brown dwarfs continuously cool over time.

Previous Research

- Our project builds on the work of Filippazzo et al. (2015). We updated their study with data from the Gaia satellite. Their study consists of 198 objects, most of which are also reviewed in this study.
- Their goal was to determine the fundamental parameters of brown dwarfs, a goal which is also attempted in this project, via updating SEDs with Gaia.

Gaia

• Gaia is a satellite that was launched in 2013. It has a far better resolution than any satellite used before, and is collecting massive amounts of data on objects in our sky.

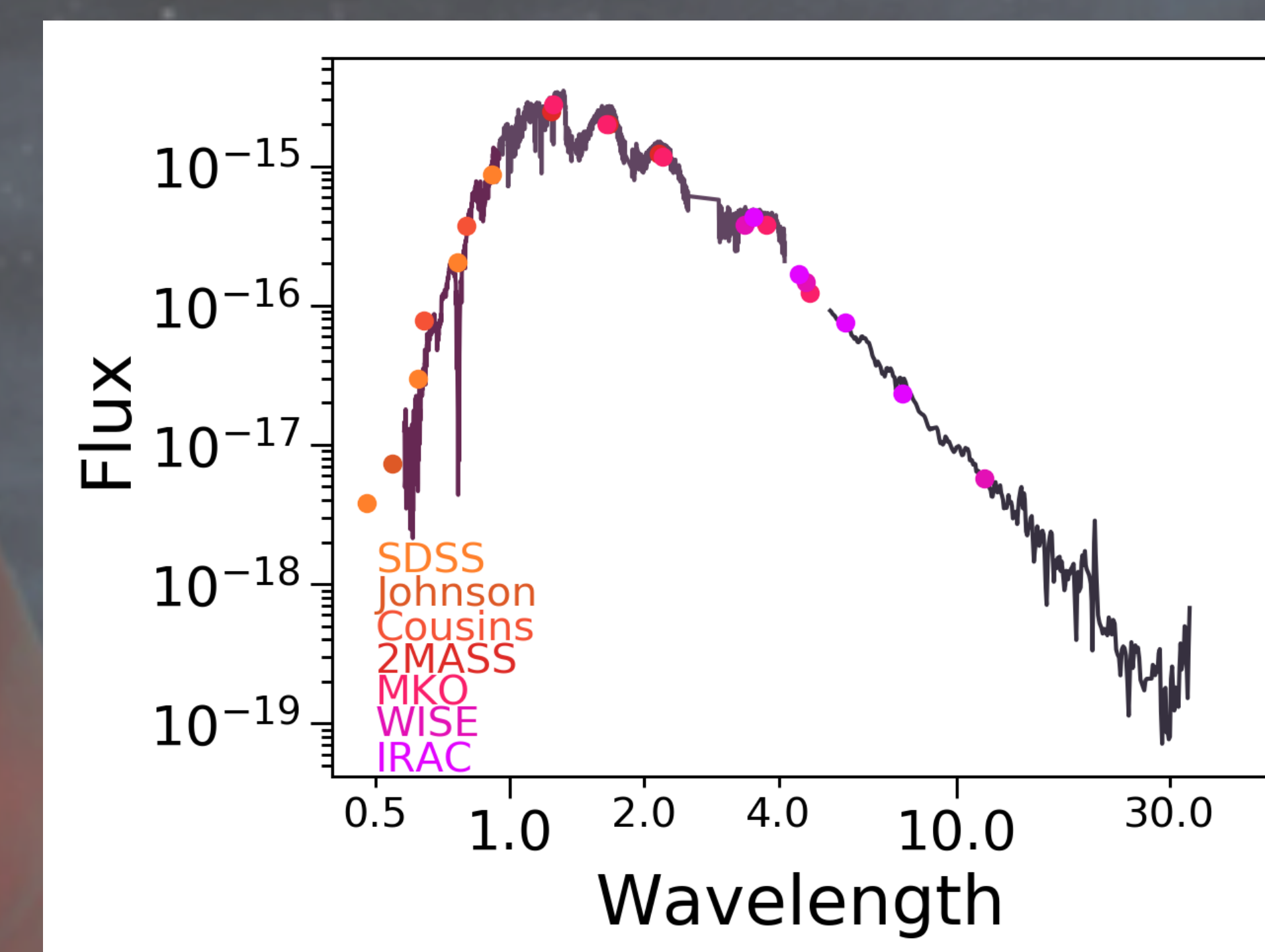


What is an SED?

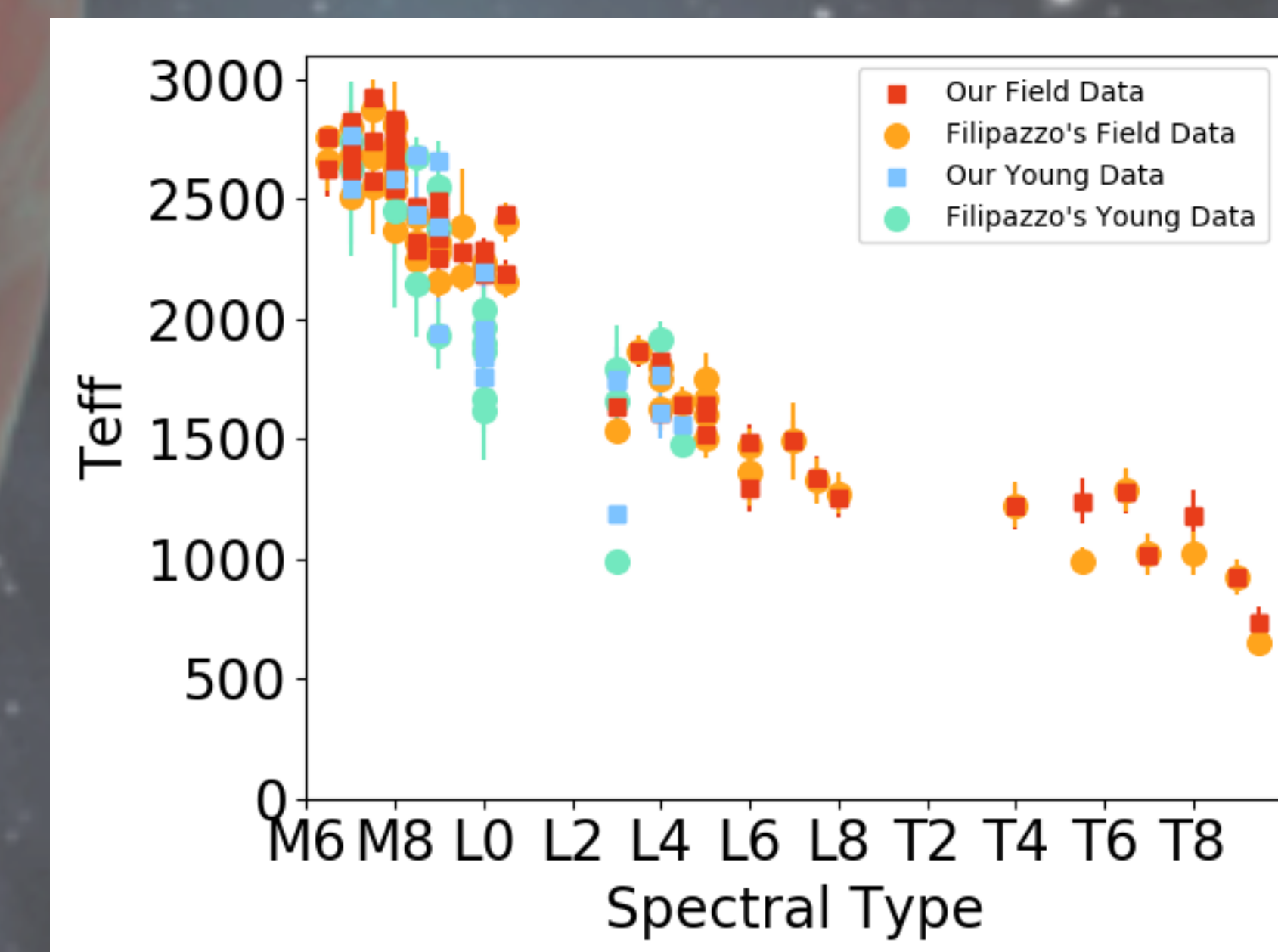
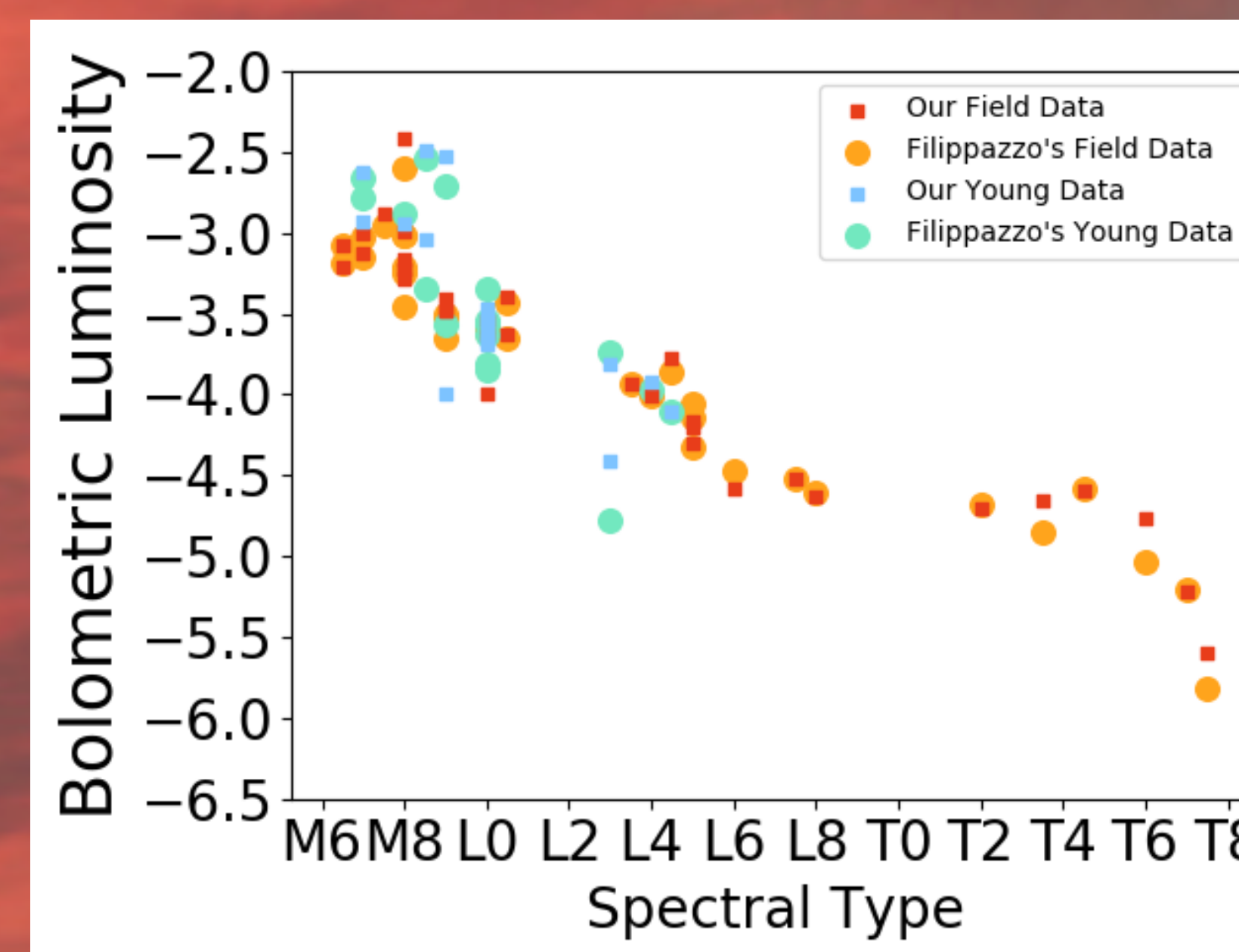
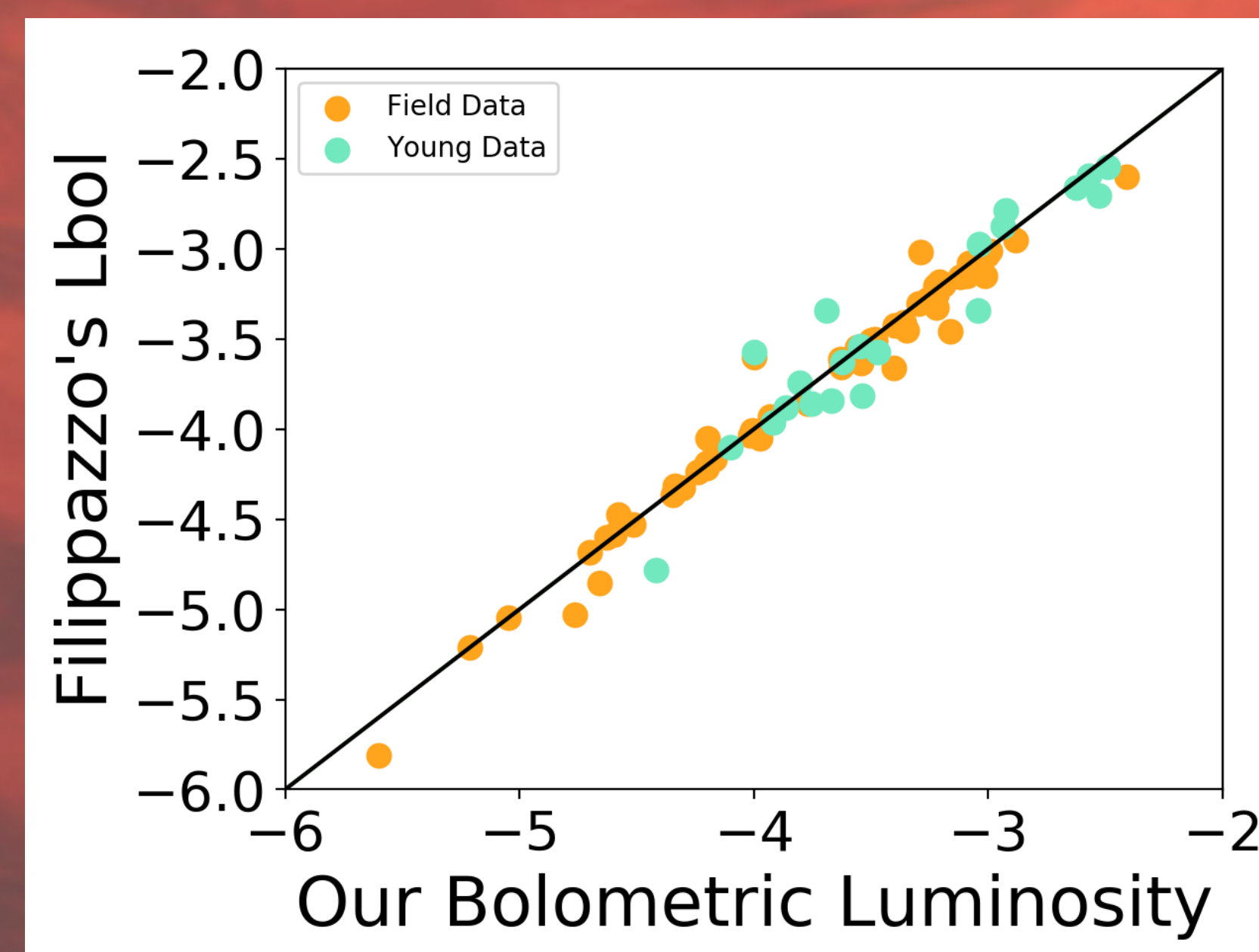
- An SED (spectral energy distribution) is the spectrum of an object scaled to the photometric points, across the wavelengths emitted by the object. The area under the curve of an SED gives you the bolometric luminosity, or total energy emitted by the object.

Fundamental Parameters

- We use SEDs to determine the fundamental parameters of 80 brown dwarfs; i.e., bolometric luminosity, temperature, age, distance, mass, radius, and surface gravity; by plugging the photometry, parallaxes, and spectra of the brown dwarfs into the Python program SEDkit, created by Filippazzo et al. (2015).



Discussion/Results



- Our bolometric luminosity data is consistent with the Filippazzo et al. (2015) data, meaning that the more precise distance measures are consistent with former estimates.

- Objects with a later spectral type tend to have a lower bolometric luminosity and temperature. Our data is consistent with the Filippazzo et al. (2015) data.

Acknowledgements

We would like to thank AMNH, the SRMP program, and Dr. Maria Strangas as well as our wonderful mentor Eileen Gonzales for providing us with a valuable experience that will benefit us for the rest of our lives.



About this template

- Use the template (slide 1) to make the poster. It will make your and my life easier.

- All posters need to have the following components
 - Introduction
 - Methods
 - Results
 - Discussion
 - Literature Cited
 - Acknowledgements
 - AMNH logo (*I will send these to you*)
 - **NOTE – Abstract is OPTIONAL for the poster**

About this template (cont.)

□ **Be creative**

- However follow the guidelines on the following slides & use the template
- A poster should have clear & concise text; however, it should be visually appealing as well.
- See example posters on srmp4life.com

□ **Remember**, the flow of the poster from (left to right) must be logical

- Intro → Methods → Results → Discussion → Literature Cited → Acknowledgements

Margins, Fonts, Text Size, Colors

- Poster size is set @ 44 in (W) x 32 in (L) – Don't mess with it!
- 1/2 in margin guides have been set - anything that extends beyond the margins may not be printed correctly
- You can choose your own font, but make sure it is professional (e.g. *something you might see in a magazine or newspaper*) and clear (e.g. *easily read at a distance*)
- The text sizes provided work well for posters. You can change them to fit your design, but not by much!
- Light colored backgrounds are okay; really dark ones are discouraged.

Titles & heading titles

- The title of your presentation is up to you (and your mentor)
 - ▣ **The title is the first thing people read:** It should be descriptive, clear, and concise (*examples to follow*)
- Heading Titles
 - ▣ Use the words “Introduction, Methods, Results, Discussion, Literature Cited, Acknowledgements”
 - ▣ However, you can add sub-titles if and when necessary
 - E.g. Under Methods → Study Area
 - E.g. Under Methods → Data Analysis

FAQs

- I'm not done with my analysis, what should I do?
 - ▣ *Poster presentations can be used to present preliminary results or even intended results*

- Can my results section consist of figures and tables, or must I have written text?
 - ▣ *Figures & texts can be used on their own, but they must explain the results objectively*
 - ▣ *Remember, you will interpret your results in the discussion*

FAQs

- Can/should I use pictures?
 - ▣ The poster is a visual medium – Yes, use images
 - ▣ But, space is in sort supply in your poster. Images– as well as text – should be chosen such that it supports the “research story” you are trying to tell. Ask yourself, why I am I using this image?
- Can I use images that are not mine?
 - ▣ *Yes, but provide a link/citation*
- What goes in the acknowledgement section?
 - ▣ *You should recognize those people and institutions that made your research possible. This can include your mentors collaborators, lab techs, funders, etc.*

FAQs

- Should the text be prose or bullet points?
 - ▣ *Either is acceptable; however, speak with your mentor*

- My literature cited section is too long. I don't have room for it!
 - ▣ *Choose 1 to 3 articles that are vital or most relevant to your study.*
 - ▣ *You need not (and should not) include your entire literature review*