Atmos: a 1-D Photochemical-Climate Model

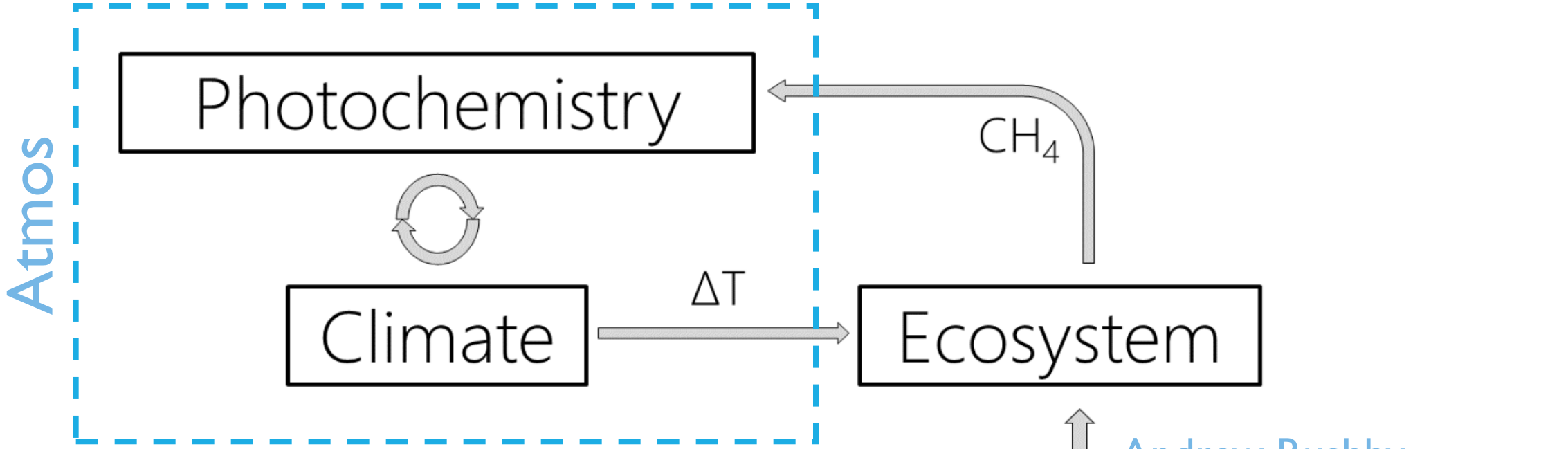
Who we are: Giada Arney, Shawn Domagal-Goldman, Ravi Kopparapu, Xandra Brosius, Mahmuda Afrin Badhan, Amber Britt (Fisk-Vanderbilt), Thomas Fauchez, Ryan Felton, Der-You Kao, Daria Pidhorodetska, Teal UMD), Alia Wofford & new collab. w/ Eliza Kempton (UMD)

- Development and improvement of a **community model** used to simulate planetary atmospheres and environments
- **Several projects**: e.g. early Earth atmospheres, new Titan template, 3-D/1-D coupling, hot Jupiters, new reaction rates, ecosystem coupling

Duration of Award: 3 years

a example of what we're working on…

Revisiting Early Earth's methanogen biosphere:

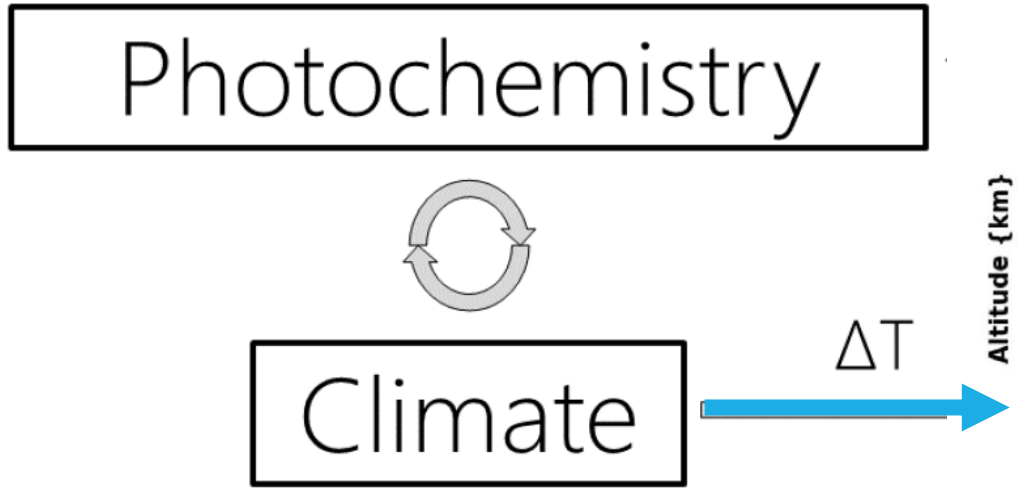


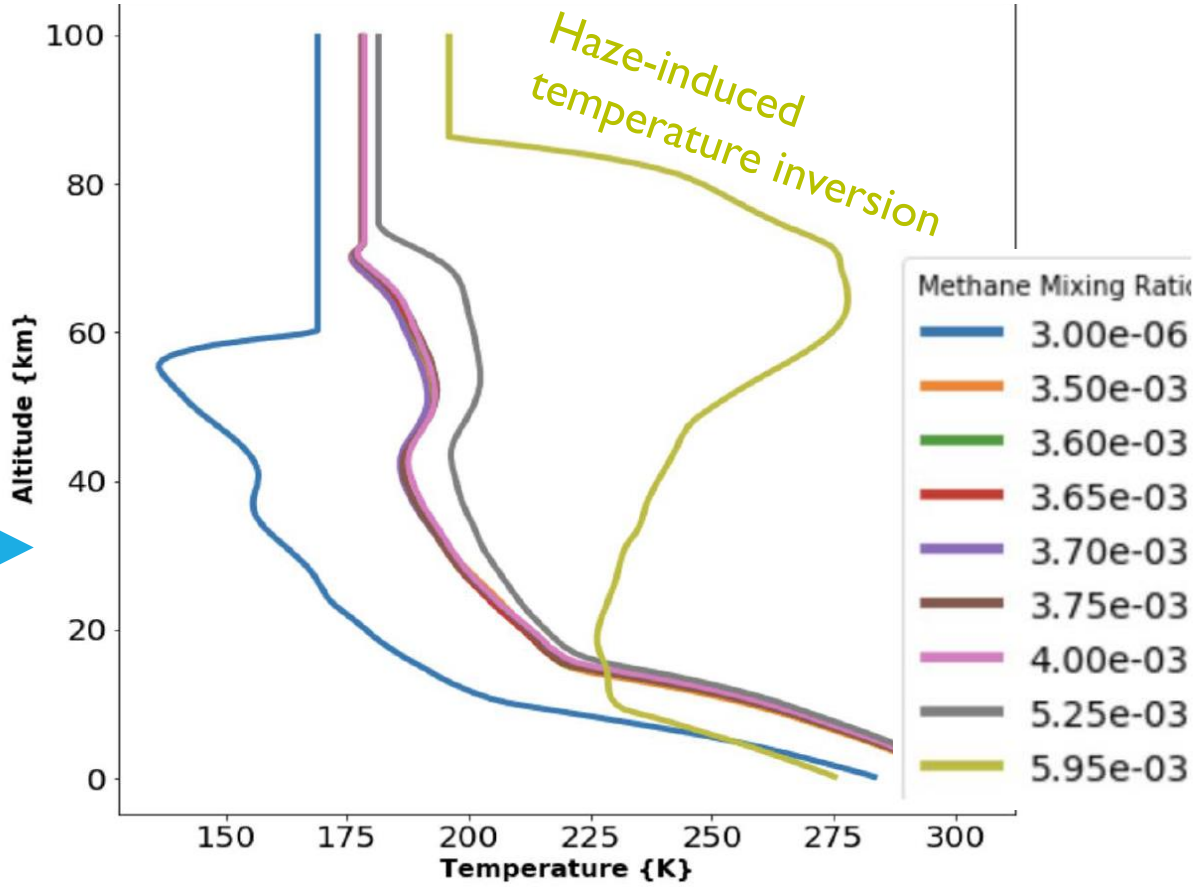
Alia Wofford

Andrew Rushby & Sanjoy Som ecosystem modeling

a example of what we're working on…

Temperature profiles – Archean Earth





Alia Wofford

what's happened & what's next?

- Presentations at AGU, CCTP-3, AAS, Goldschmidt, Habitable Worlds
- Development/improvement of an open source community model (Teal)
- New collaborations w/ Eliza Kempton (UMD), Andrew Rushby (Ames)
- Paper submitted by Mahmuda Afrin Badhan
- **Support for early career scientists/students**

Future Work, e.g.,

- Linking early methanogen biosphere project to GENIE model w/ Chris Reinhard (GA Tech)
- More model improvements: e.g. updates to reaction rates (Der-You Kao, Daria Pidhorodetska)
- Studies of diverse planets (e.g. Titan-like planets - Ryan Felton, hot Jupiters – Mahmuda Afrin Badhan)