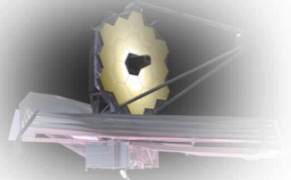


Transiting exoplanet observations with JWST: preparing the Early Release Science program



Nicolas Crouzet

In collaboration with Laura Kreidberg, Vivien Parmentier, Natalie Batalha, David Sing, Pierre-Olivier Lagage, Jacob Bean, Kevin Stevenson, Hannah Wakeford, Zach Berta-Thomson, Bjorn Benneke, Julianne Moses, Pascal Tremblin, Olivia Venot, Peter Gao, Sarah Kendrew, Tom Greene, Kamen Todorov, Jonathan Fraine, Ludmila Carone, Sarah Casewell, Fred Lahuis, Mike Line, Jean-Michel Désert, Heather Knutson, Daniel Angerhausen, Jasmina Bleicic, Eliza Kempton, Natasha Batalha, *et al.*



Goals of the JWST ERS program:

- ensure **open access to representative datasets**
- **engage the astronomical community** in familiarizing themselves with JWST
- design **science demonstration** programs that utilizes key instrument modes
- **understand JWST's capabilities**

The transiting exoplanet ERS program:

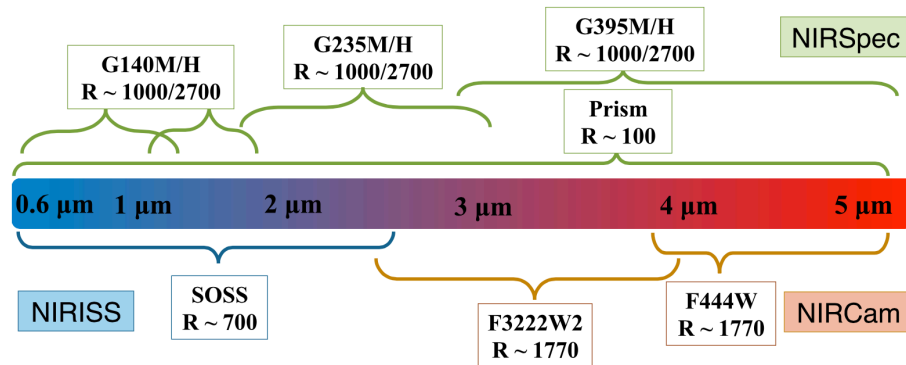
- a **community program** with ~60 people involved
- evaluate JWST for **spectroscopy of transiting exoplanet atmospheres**
- four sub-programs, ~80 hours of observing time

Program 1: "Simply the Best"

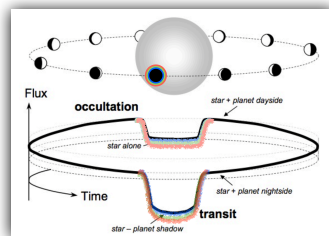
Chair: **Kevin Stevenson**, Co-Chair: **Hannah Wakeford**

Goals

- Extract **atmospheric transmission spectra** of one or several exoplanets from 1 to 5 μm
- Compare the **various observing modes** that are available for transit spectroscopy



Which modes are best suited to exoplanet transit spectroscopy?

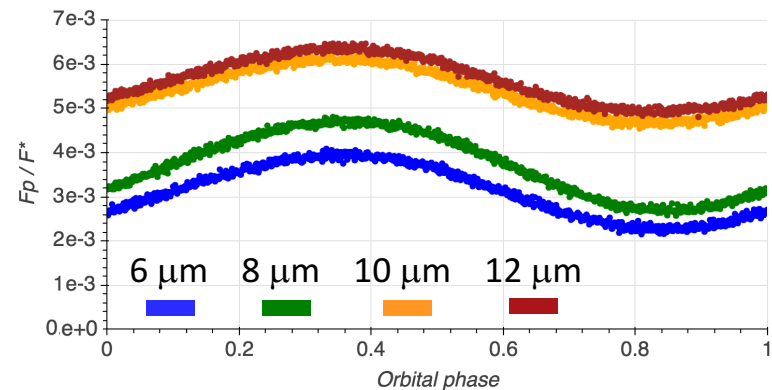
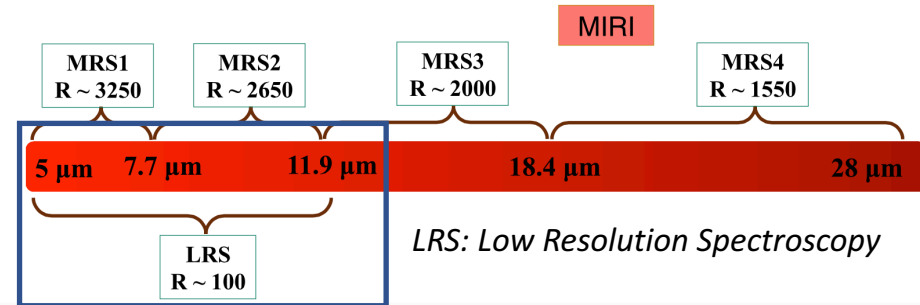


Program 2: "MIRI Phase Curve"

Chair: **Laura Kreidberg**, Co-Chair: **Nicolas Crouzet**

Goals

- Extract the **spectroscopic phase curve** of a transiting hot Jupiter from 5 to 12 μm
- A deep evaluation of **MIRI/LRS** for transiting exoplanets



MIRI/LRS phase curve simulations of WASP-43b with a clear atmosphere (Only the phase curve is shown, without transit/eclipse)

Program 3: “Data Challenge”

Chair: **Zach Berta-Thomson**, Co-Chair: **Mike Line**

A transverse program

- **Prepare** data analysis and interpretation **tools** and make them available
- **Identify** the major systematic **noise**
- Determine **best practices**

Program 4: “Wild Card”

Chair: **Björn Benneke**

A complementary program

- **Secondary eclipses** of high SNR targets
- Evaluate NIRISS and NIRCcam for **bright stars** ($K < 8$)

Next steps

- Proposal submission deadline: **August 18, 2017**
- Observations **early in Cycle 1**
- Data and tools will be **available to the community**
- Everyone is welcome to contribute!

<https://jwst.stsci.edu/science-planning/calls-for-proposals-and-policy/early-release-science-program>

