Our findings suggest this triple merger impacts their surroundings and that galaxies with multiple AGNs are in a phase of their evolution where they’re capable of producing feedback effects to other galaxies.

Introduction
An enormous rift between theory and observation exists in the field of triple mergers. According to cosmological simulations, 16% of mergers are believed to be triple mergers, however, only a handful have been observed. Triple mergers are extremely rare to encounter for multiple reasons i.e.: the amount of gas and dust in the system serve to obscure it, the merger can occur on such a short time scale we don’t have enough time to observe it, or a combination of both. Because we’ve only seen a handful, there is still so much we don’t know about triple mergers. We hope to answer the general questions proposed when active galactic nuclei (AGN) mergers are observed – how much mass is accreted, how does the gas around the system behave, how quickly is the gas expelled, and is the AGN obscured?

Methods
Our data was collected using Spectrometre Imageur a Transformee de Fourier pour l’Etude en Long et en Large de raies d’Emission (SITELLE) at the Canada-France-Hawaii Telescope (CFHT). SITELLE is an optical imaging fourier transform spectrometer with a field of view of 11 by 11 arcminutes. After our data was collected, we created flux and contour plots to see how the gas around our system was behaving. With this, we were able to study the morphology of this triple AGN merger. The flux/contour plots were created with python, primarily with the usage of ORCS, a package created by the CFHT team for analyzing SITELLE data.

Results
As we can see from the results, in the plot of Hβ, the contours are bunched up where AGNs are suggesting these areas are star forming regions. In both the [OIII] contour plots, the contours don’t align with the AGNs. This can occur as a result of astrometric errors, galactic outflows, or shocks associated with the merger. The emission lines were reduced as a result of the interference of a cosmic ray with our data. These lines were observed with the C3 filter which corresponds to 511-556 nm.
If we’re looking for AGN feedback, multiple AGN systems are a good place to start! It should also be emphasized that even though the AGN is impacted the interstellar medium (ISM), we’re not clear on the impact of star formation since we’re still working on the kinematics. Studying the kinematics of this system is still a work in progress since our data containing OII lines were impacted by a cosmic ray.

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