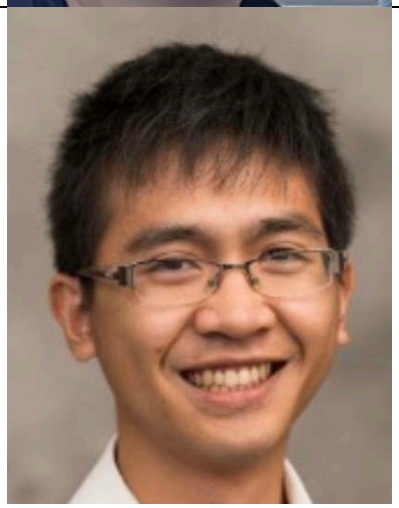
Participants and research interests
Summer 2019, Lexington

Gary Ferland University of Kentucky I work on the chemical evolution of the Universe, understanding how the spectrum forms, and using this spectrum to understand the Universe.	
Maryam Dehghanian University of Kentucky I work on the abnormal behavior of NGC5548, in which the absorption and emission lines decorrelated with the continuum, “went on a holiday”. They are typically highly correlated, and this correlation is the requirement for the BH mass estimations. I do photoionization modeling using Cloudy, along with developing the code. This is a pan-spectral study with a huge data set in hand, taken from 6 space-based telescopes. Recently, we could explain the absorption-lines holiday and we are almost done with the emission-lines holiday. We could also find some interesting results regarding changing-look quasars	
Francisco Guzmán University of Kentucky I have been developing cloudy during the last 4 years. I have mainly but not only focused on collisions and the He- and H-like iso-sequences and their impact in cosmological abundance determinations. Other aspects of my research cover atomic radio recombination lines and spectroscopy in all wavelengths.	

Priyanka Chakraborty University of Kentucky I am currently working on the spectra of Perseus cluster and comparing with the X-ray Hitomi Observations. I use Cloudy to run the models to produce the spectra.	
Marios Chatzikos University of Kentucky I have been a Cloudy developer since 2012. I have mainly worked on emission lines (hyperfine, coronal, X-ray) produced by the hot gas in galaxy clusters.	
Arnab Sarkar University of Kentucky An American journalist, Arthur Brisbane, once said "A picture is worth a thousand words", sometimes in my spectroscopy and atomic physics class my professor recalled the quote as "A spectra is equal to a thousand type of Physics". Anyway, my goal is to learn how Cloudy takes "thousand type of Physics" into account and produces spectra of astronomical objects for my future projects.	

Dirk Grupe, Morehead State University My research interest are primarily Active Galactic Nuclei, in particular Narrow-Line Seyfert 1 Galaxies, which we think are AGN in a younger stage which black hole masses are relatively low and their Eddington accretion rates high. My goal in using Cloudy is to examine the differences in the underlying continuum between Narrow Line and Broad Line Seyfert 1 galaxies. In particular it might help us to better understand the anti-correlation fund in AGN between the FeII emission from the Broad Line Region and the [OIII] emission from the Narrow Line region.	
Francisco (Paco) Holguin University of Michigan-Ann Arbor My research involves three dimensional magnetohydrodynamic simulations, including cosmic ray hydrodynamics, modeling the impact of cosmic ray feedback on the dynamical and thermal state of a galaxy. Cloudy would be useful to my research in connecting simulation results to observables, such as absorption and emission lines.	
Katrina Litke University of Arizona I use fine structure line observations from ALMA to study the ISM in gravitationally lensed dusty star forming galaxies at z~4-6. I "de-lens" the galaxies to study their spatial and kinematic structure. I would like to use CLOUDY to model and try to understand the conditions in the gas throughout these extremely star-forming galaxies.	

Sally Heap NASA's Goddard Space Flight Center I've been working on developing a concept for a UV space telescope, which will be submitted to Astro2020 in July. Partly for this development, I am interested in the origins and radiative transfer of Lyman-alpha emission in galaxies including dust. I have worked with Ivan Hubeny (Univ of Arizona) on Cloudspec, a program written by Ivan which uses Cloudy 13.04 to derive the emission spectrum and physical properties of a source and then uses Ivan's program, SYNSPEC, to calculate the NLTE absorption spectrum as well.	
DK (Dhanesh Krishnarao), University of Wisconsin-Madison I primarily study the diffuse ISM in galaxies, focusing on ionized gas in the Milky Way. I hope to use Cloudy to better understand the ionization mechanisms of gas in the inner Milky Way that has properties similar to LI(N)ERs in extragalactic systems. I also study diffuse gas in other galaxies using large IFU surveys, such as SDSS MaNGA ultimately will combine extragalactic insight to better understand how gas in our own Galaxy behaves and is powered/ionized.	
Sinan Allak University of Canakkale, Turkey I primarily study ultraluminous x-ray sources (ULXs). Some ULXs are in the nebula, stars forming region or star cluster. I want to focus to relationship of ULXs with their environment, so Cloudy so important for photoionization models.	

Guochao (Jason) Sun, Caltech I am using the line intensity mapping (LIM) technique to cosmic structure formation. I investigate multi-phase ISM using LIM with multiple tracers. The [CII] serves as a good tracer of star formation that allows us to constrain the cosmic star formation out to very early Universe like the Epoch of Reionization. I will use CLOUDY to model the [CII] line in different ISM environments, which is really complicated! I would also like to use CLOUDY to develop a model of extended [CII] emission, something being recently observed at very high redshifts.	
Rebecca Mikula Morehead State University I primarily research active galactic nuclei. For the last year or so I have been working with the changing look AGN NGC1566 and would like to learn more about it using cloudy. I have a particular interest in infrared spectroscopy, especially pertaining to dust.	
Thanawuth (Atom) Thanathibodee University of Michigan Accretion processes in pre-main sequence stars and their connection to the properties of the warm inner region of the surrounding protoplanetary disks. I use emission lines to measure accretion rate, temperature, and geometry of the accretion flow, and study how these properties changes with stellar parameters. I would like to use Cloudy to extend the current magnetospheric accretion model used in our group to include a more realistic temperature prescription in the accretion flow and to include other accretion-related emission lines.	

Joseph (Hyunseop) Choi University of Oklahoma I am working with Dr. Karen Leighly on studying the energetics of the broad absorption line (BAL) quasar outflows. We have developed a spectral synthesis code called SimBAL to model the BAL feature in quasar spectra to understand and quantize the physical properties of the quasar outflows from large samples of quasars. We use CLOUDY to generate a large grid of ionic column densities and SimBAL uses the grid to generate the absorption features.	
Joey Hammill Embry-Riddle University Daytona Beach I'm hoping to become more acquainted with Cloudy and the theory behind it as part of a project I'm joining next year with my advisor in which we will be attempting to fit models of gas and dust clouds around specific stars and representative models as part of two different studies.	
Elizabeth Tarantino University of Maryland - College Park I work on the ISM in nearby galaxies, particularly in low-metallicity environments. My research is focused on HII regions in the Small Magellanic Cloud (SMC), where we have a wealth of infrared spectroscopy of mid and far fine-structure lines. We wish to use Cloudy to model these lines, yielding a description of the energy, density, ionization, and other conditions of the star-forming gas in the SMC. I have also studied [CII] emission in nearby galaxies, exploring the multi-phase origin of this major gas coolant and star formation tracer.	

Amy Steele University of Maryland at College Park I study the properties of metals in circumstellar gas around polluted white dwarfs (WDs) with my advisor, John Debes (STScI). A polluted WD is one that shows the presence of elements heavier than expected (e.g. Mg, Si, and Ca) and I use Cloudy to gain insight into the physical characteristics of the metals in these systems.	
Prerak Garg University of Florida I work on nebular line emission to understand why galaxies at high redshift do not follow the same locus as local galaxies on the BPT diagram. There is ample evidence from observations showing this offset but the reason behind it is still unclear. We trying to answer this question by self-consistently modeling a large sample of star-forming galaxies using hydrodynamic simulations (SIMBA) and photoionization models of ionized regions (CLOUDY).	
Grace Olivier The Ohio State University I'm working with Danielle Berg, on a sample of star-forming galaxies in the local universe with extreme emission lines in the UV. We plan to use Cloudy to model the ionization from the stellar population to see if this is enough to cause such high emission from these lines, and if not, what the possible ionization sources could be.	

Vivek Mariappan Pennsylvania state university. I mainly study outflows in quasars by probing the the variability of broad absorption lines. I plan to use CLOUDY to do the photoionization modeling of the absorbing clouds which can constrain the distance and energetics of these outflows.	
David Carr Indiana University I am interested in Active Galactic Nuclei, specifically how the demographics of AGN change across cosmic time. Using cloudy, I am trying to create models of AGN with different metal abundances to see if my high redshift sample of AGN matches the cloudy models with lower metallicity.	
Nao Suzuki Kavli IPMU, University of Tokyo I have been working on the field of precision cosmology and started my career on measuring Deuterium abundance in the intergalactic medium (IGM) to probe Baryon Density where I first met "Cloudy". Now, I'm working on Type Ia supernova cosmology and happened to identify a featureless perfect blackbody star. I wish to know which physical condition can make all of lines disappeared. I'm interested in investigating cosmic ionization history using Lyman series in the Quasar Absorption Lines.