



מכון הנרייטה סאלד
המכון הארצי למחקר במדעי ההתנהגות

תוכנית מנחים עמיתים

פלווארסצנציית רנטגן בגלקסיות פעילות

X-ray fluorescence in active galactic nuclei



משרד החינוך
המינהל הפדגוגי
האגף למחוננים ולמצטיינים



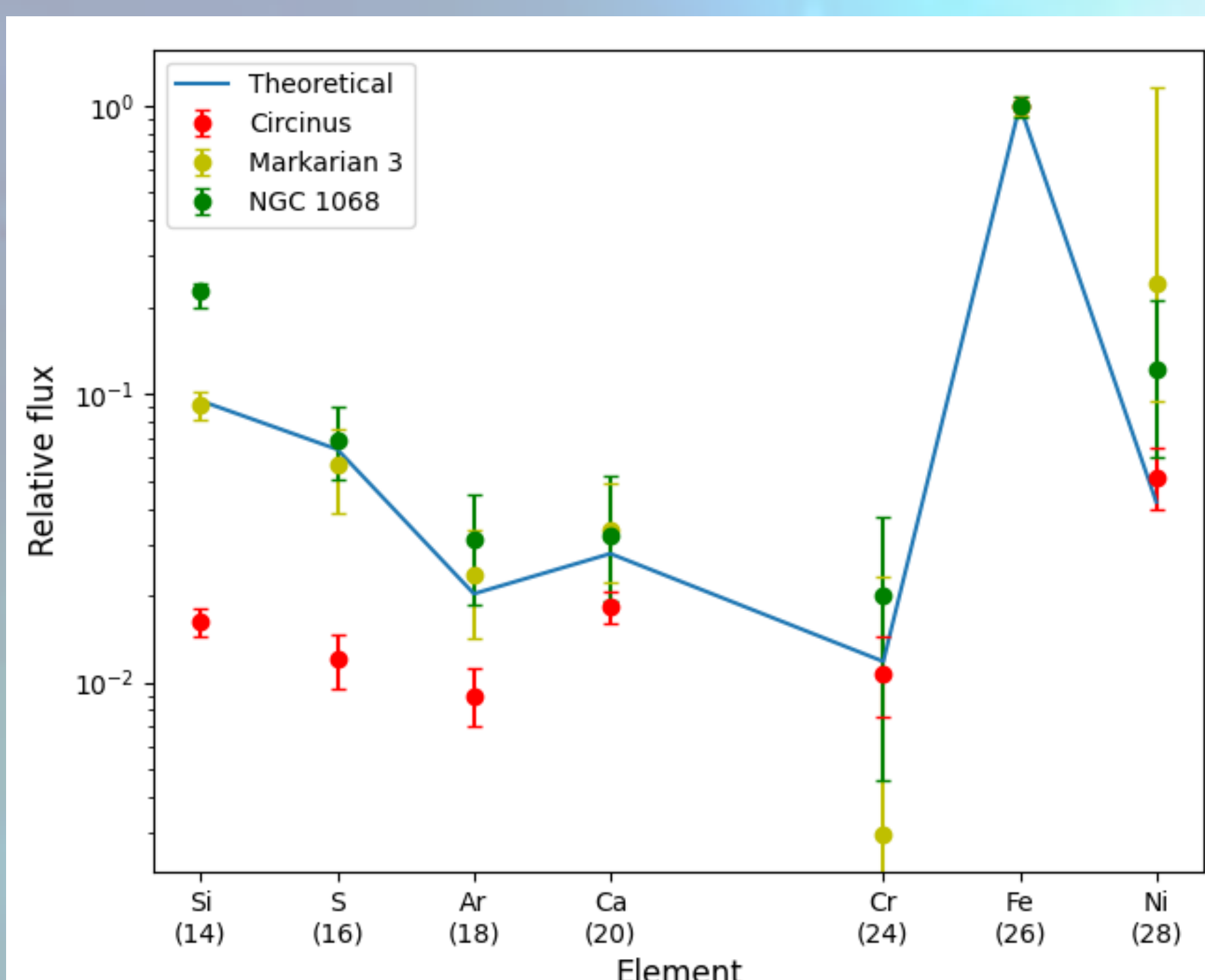
חניך: אחמד גנאים, תיכון אלחכמה, סכנין
מנחים-עמיתים: פרופ' אהוד בכר ורועי רחין
הפקולטה לפיזיקה, הטכניון, חיפה



Fluorescence is the emission of X-ray photons by excited neutral atoms to bring the atom back to the lowest energy state of the atom after having absorbed an X-ray photon.

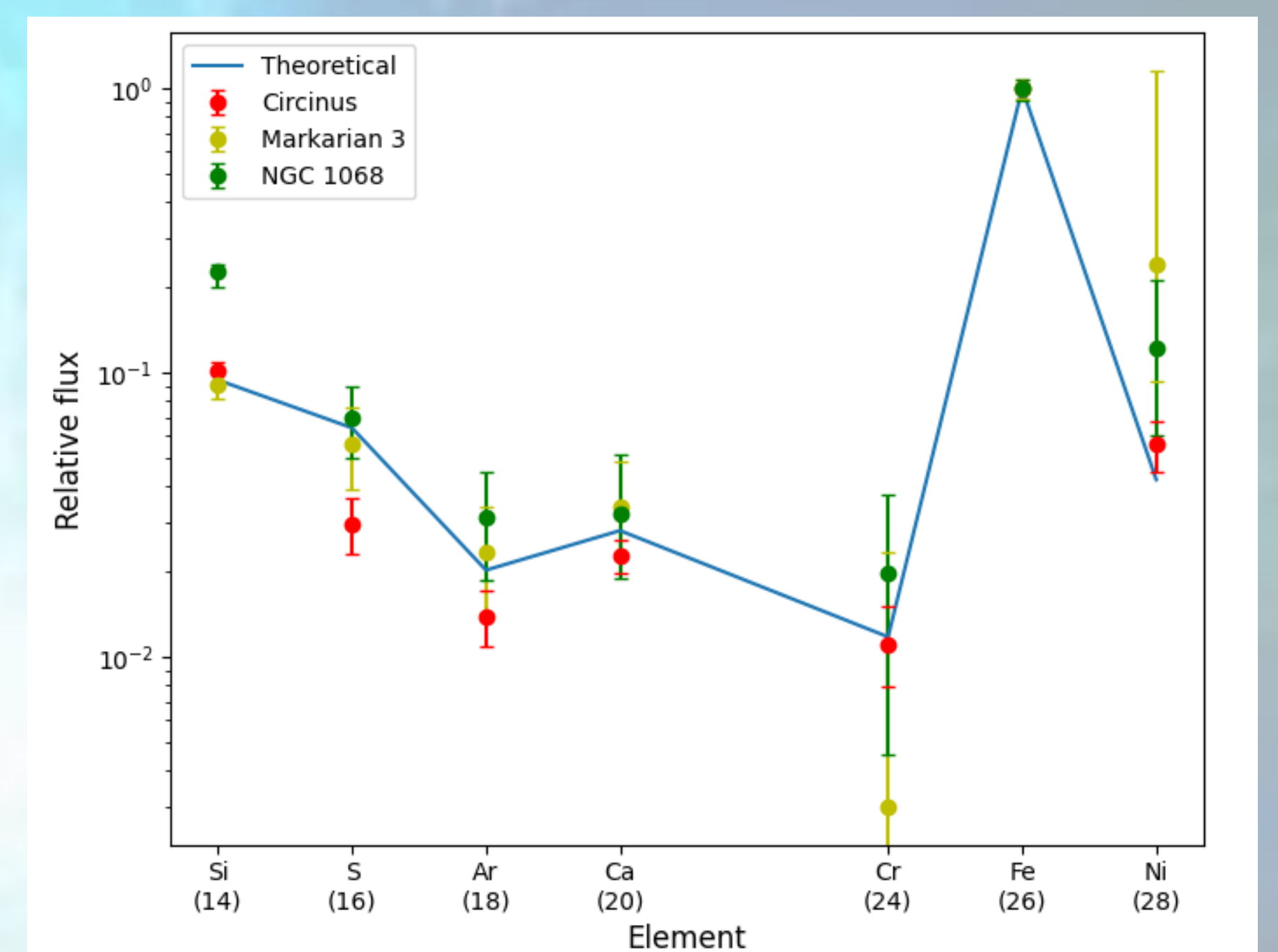
We looked at galaxies that show fluorescence characteristics: Circinus, Markarian 3 and NGC 1068.

We used a simplistic model to predict relative intensities (amounts) of materials in these galaxies. This model, however, predicted incoherent results:



A naïve interpretation would be that there is less material in Circinus than the other galaxies, but we know that this is probably not the case because all observed galaxies of this type (Seyfert-2) have the same relative intensity

To explain this inconsistency, we looked over our assumptions, one of them was the amount of material in the observing telescope's line of sight towards the galaxies. We assumed that there is no intervening matter other than the matter in our own galaxy, this assumption however, turned out to be wrong. After accounting for this intervening cloud of matter, our results are very consistent with our model:



CONCLUSION

A simplistic model is good to explain fluorescence in galaxies, that is, excluding Circinus, where we found inconsistent results, the best explanation we found for this was the presence of extra matter inside Circinus that is obscuring our line of site and changing the observation.

This finding contradicts the current understanding of these kinds of galaxies and requires further research, such as, why is Circinus different and what makes an accurate representation of these galaxies



Left – Circinus observed by Chandra telescope
Right – Circinus observed by Hubble space telescope