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Thank you SAIL Institute and  
NYSERNet



Enhanced skills to thrive

# 2019 Leadership Academy with Dr. Jackie Malcolm and Khaleel Gathers from Buffalo State College



<https://sunysail.org/about-sail/cio-leadership-academy/>

# Strategic Plan

Information Technology | Strategic Plan | June 2019



- The role of IT must be reimagined and to not accept the status quo.
- Provide real-time support
- Safety on campus

<https://it.buffalostate.edu/strategic-plan>

## IT Enterprise Infrastructure Services Goals

- supporting the campus network, storage and backup
- providing VoIP, phone services
- managing the doors and security camera systems



## IT is working with students...

- ✓ Teletherapy
- ✓ Telehealth
- ✓ Remote instruction
- ✓ Gateway servers



# SUNY Urban Engaged Campus

- Buffalo State is the only urban engaged SUNY campus
- Bengals Dare to Care Projects & painting  
**Buffalo Orange**



# Bengals Dare to Care Day



Volunteers Gardening

- Implementing electronic volunteer forms
- Webpage designs & video production
- Achieve student success

<https://cce.buffalostate.edu/bengalsdaretocareday>



# Community Partners

# Project Description

5 Loaves Farm	Join fellow students and enjoy the outdoors while helping out with various garden maintenance projects!
Algonquin Sports for Kids	Are you athletic and love sports? Help local youth experience and enjoy a variety of sports activities and stations.
Artspace Buffalo Community Garden	Help Artspace Buffalo make its community garden beautiful while getting your hands a little dirty!
Because Char Smiled	Are you creative and crafty? Make origami paper flowers to send to patients at Roswell Park Cancer Center!
Bird Herkimer Block Club	Help this community block club beautify garden areas and clean up local streets.
Buffalo City Mission	Check out some local treasures and help this thrift store get organized by sorting clothes!
Buffalo Niagara Waterkeeper (Scajaquada Creek)	Get to know our local Scajaquada Creek area while getting it clean and beautiful.
Buffalo Niagara Waterkeeper (Unity Island)	Explore beautiful Unity Island and see the Niagara River while cleaning up this park space.
Buffalo Niagara Waterkeeper (Red Jacket Park)	Immerse yourself in the nature of this riverfront park while helping to clean it up.
Buffalo Prenatal Perinatal Network	Get out your bandanas and enhance your painting skills while painting apartments for local residents in need!
Buffalo Public School #18	Get your hands dirty in some soil while picking veggies and helping to winterize a community garden.
Buffalo Public School #45	Enjoy the fresh air while cleaning up a local school area for kids and residents to appreciate!

<b>Community Partner</b>	<b>Project Description</b>
Buffalo State College	Looking for a service project right here on campus? Help clean up our campus while getting to know it more.
Camp Centerland	Like being outside or by the pool? This kids camp needs your help packing up for the end of the season.
Community Action Organization of Erie County, Inc.	Tune up your organization skills and learn how to paint while getting this storage space neat and tidy.
Compass House	Have a green thumb? Help out with garden projects and planting flowers!
Compeer of Greater Buffalo	Have some fun while setting up games and other materials for this exciting upcoming carnival!
ConnectLife (UNYTS)	Enjoy arts and crafts? Come out and assist with Saturday Academy's family programming and community activities!
Elmwood Village Association	Get to know the popular Elmwood Ave. area of Buffalo while cleaning up this vibrant neighborhood walking distance from campus!
Friends of Night People	Help someone in need stay warm this fall by assisting in switching out seasonal clothing in this organization's open closet.
Futures Academy BPS #37 (Say Yes Buffalo)	Enjoy arts and crafts? Come out and assist with Saturday Academy's family programming and community activities!
Grant Amherst Business Association	Strong and looking to sweat a bit? Help clean up and trim our local Scajaquada Creek-line.
Harriet Ross Tubman School Community Garden	Enjoy the fall weather and get those gardening gloves on to help prepare this community garden for winter.
Latin American Cultural Association	Like uncovering what's within a collection of old books? Help this organization sort through and organize its many collections!
Mayer Avenue Community Garden	Engage your green thumb and plant some trees while sprucing up this community garden space.


<b>Community Partner</b>	<b>Project Description</b>
Central Terminal	Get out and explore a different neighborhood of Buffalo while making our streets cleaner!
Mead Library	Help enhance the green space surrounding Mead Library to make it more enjoyable for all!
None Like You/ We Care - Northumberland	Help make Buffalo greener and cleaner by improving a community garden space!
None Like You/ We Care - East Delavan	Break out the gardening gloves and help make this community garden cleaner and more beautiful!
North Park Community School	Help facilitate fun activities for children and families during this school's Saturday farmer's market!
Northwest Community Mental Health Center - Vulcan	Develop some new gardening skills and get your hands dirty while making this outdoor space more beautiful.
Northwest Community Mental Health Center - Elmwood	Never used a shovel before? Today is your day! Get some new experience while enjoying the outdoors.
Pelion Garden at City Honors School	This is your opportunity to plant some flowers and get some experience harvesting veggies and engaging your green thumb!
PLDG West	Never had a chance to plant a garden and get your hands in the soil? This is your chance! Join in this spring garden project.
Riverside High School (Say Yes Buffalo)	Have a knack for organization and a love of clothing? Help this free clothing store get organized!
Science Magnet School (Say Yes Buffalo)	Learn how to use a hammer and tend to garden beds to make this school a greener space.
The Foundry	Are you crafty and handy? Gain some hands-on experience in house repair at this Buffalo artists' space!
Vision Niagara	Get out and explore some local parks and shoreline while cleaning them up.

# Research and Creativity Conference

## Over 400 Students Participate



# Fashion Tech to Physics



**Buffalo State**  
The University of New York

## Growth and magnetic properties of $Mn_4Ta_2O_9$ and $Fe_4Ta_2O_9$ thin films

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### Abstract

The present progress of two structural multiferroics,  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$ , grown by a conventional solid-state reaction. These oxides, also known as "multiferroic", undergo an antiferromagnetic (AFM) ordering below  $T_N \sim 110$  K and a ferroelectric ordering in applied magnetic fields in the AFM state. The x-ray diffraction analysis confirms single phase purity of these compounds. We also prepared  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  thin films on the  $n$ -axis  $\alpha$ - $LiNbO_3$  and  $LiNbO_3$  crystal substrates by Magnetron Sputtering Deposition. The thin films show a preferential growth before the c-plane of both the compounds. The magnetic properties of both the bulk and thin films of  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  have been measured. The AFM transition temperature of the bulk samples varied the AFM transition temperatures at  $T_N \sim 97$  K and  $T_N \sim 80$  K for  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$ , respectively, consistent with the values reported in the literature. Surprisingly, the AFM transition temperatures for  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  thin films were observed at  $T_N \sim 140$  K and  $T_N \sim 110$  K, significantly higher than  $T_N$  values for the bulk samples. The magnet versus field curves, for both the bulk and thin films, display the AFM characteristics – linear with no saturation. The enhancement of the AFM transition in both thin films is intriguing, and more work is needed to confirm it.

### Results and Discussion

#### XRD Patterns of $Mn_4Ta_2O_9$ and $Fe_4Ta_2O_9$ Thin Films

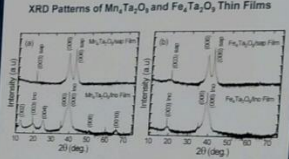


Figure 2: X-ray diffraction patterns of (a) 50 nm  $Mn_4Ta_2O_9$  thin film, deposited on (001) sapphire and (001)  $LiNbO_3$  (Ino) substrates, respectively. Comparing with the bulk XRD patterns, all the observed peaks come from the (0 0 l) planes of  $Mn_4Ta_2O_9$ . Especially, the  $Mn_4Ta_2O_9$  thin film shows a series of the c-plane, which means that this film is single crystalline and fully oriented to the substrate. (b) 50 nm  $Fe_4Ta_2O_9$  thin film, deposited on (001) sapphire and (001) Ino substrates, respectively. A strong peak at  $-38^\circ$  comes from the (006) plane of  $Fe_4Ta_2O_9$  in both samples. The peaks from both substrates are from the (001) and (002) planes of sapphire and  $LiNbO_3$ .

#### Magnetic Properties of $Mn_4Ta_2O_9$ and $Fe_4Ta_2O_9$

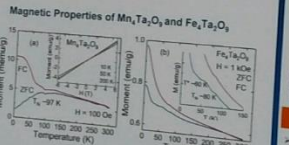


Figure 3: (a) The zero-field cooled (ZFC) and field cooled (FC) magnetic moment (M) as a function of temperature (T) under an applied field (H) of 10 kOe, 50 kOe, and 200 kOe, demonstrating the AFM transition. The inset shows the M-H curves at  $T_N \sim 97$  K. (b) The ZFC and FC moment versus temperature with  $H = 1$  kOe for  $Fe_4Ta_2O_9$ . The inset shows a close-up view of the AFM transition around  $T_N \sim 80$  K. In addition, the second peak was also measured at  $T \sim 80$  K, which has been observed in the specific heat data [3].

### Introduction

- $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  belong to the  $Cu_2Mn_2O_7$  family which crystallize in a trigonal crystal structure (space group  $P3m1$ ).
- Antiferromagnetic (AFM) ordering between  $-80$  K and  $100$  K.
- Spin-Flip transition in applied magnetic fields
- Ferroelectric polarization develops due to the magnetic structure.
- These compounds are type II multiferroic.
- Strong magnetoelectric and magnetocaloric effects.
- The magnetic structure is controversial: the c-axis alternating spin chain versus the AFM spin ordering in the ab-plane.

### Experimental Methods

- $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  compounds were synthesized by a solid-state reaction.
- For instance,  $Mn_4Ta_2O_9$  was synthesized by a two-step method as follows:
 
$$\text{First step: } 4MnO + Ta_2O_5 \rightarrow Mn_4Ta_2O_9 + O$$

$$\text{Second Step: } 4MnO + MnTa_2O_7 \rightarrow Mn_4Ta_2O_9 + O$$
- Radio-frequency Magnetron Sputtering was used to deposit  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  thin films on (001) sapphire and  $LiNbO_3$  substrates.
- X-ray diffraction was used to characterize the structural properties.
- Vibrating Sample Magnetometer (PPMS; Quantum Design) was used to measure the magnetic properties in the temperature range  $4$  K –  $300$  K.

### Conclusions

- We successfully synthesized single phase  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  compounds by a conventional solid-state reaction. Their magnetic transition temperatures of 97 K, and 80 K are consistent with the expected values.
- $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  thin films were successfully deposited on (001) sapphire and (001) Ino substrates by RF Magnetron Sputtering. These thin films show the c-plane orientation, indicating a single crystalline film growth.
- AFM transition temperatures of  $Mn_4Ta_2O_9$  and  $Fe_4Ta_2O_9$  thin films were observed at  $T_N \sim 140$  K and  $110$  K, significantly higher than that of the bulk at  $T_N \sim 97$  K and  $80$  K. The M-H curves show AFM character.
- Thin films of these compounds potentially allow to increase the AFM transition temperature. A detailed study is underway.

Acknowledgement:  
This project was supported by National Science Foundation (DMR-1426756).





- Poster board for the students created in-house
  - Video production, website hosting and event database storage
- <https://undergraduateresearch.buffalostate.edu/srcc>

# Community Engagement During COVID19



- Feedmore WNY
- American Red Cross
- Jewish Family Services

<https://cce.buffalostate.edu/volunteer-information-during-coronavirus-covid-19-crisis>

# Burchfield Penny Art Center on Campus





# Café & Point of Sale Registers



# Luminating Multimedia Art Canvas



<https://www.burchfieldpenney.org/>

# Enhanced Academic Support Services in the Renovated Academic Commons Library



- Virtual Tours and video production
- Providing Wi-Fi and networking
- Configuring VOIP, phones

<https://library.buffalostate.edu/renovation>

# IT Help Desk in new Academic Commons

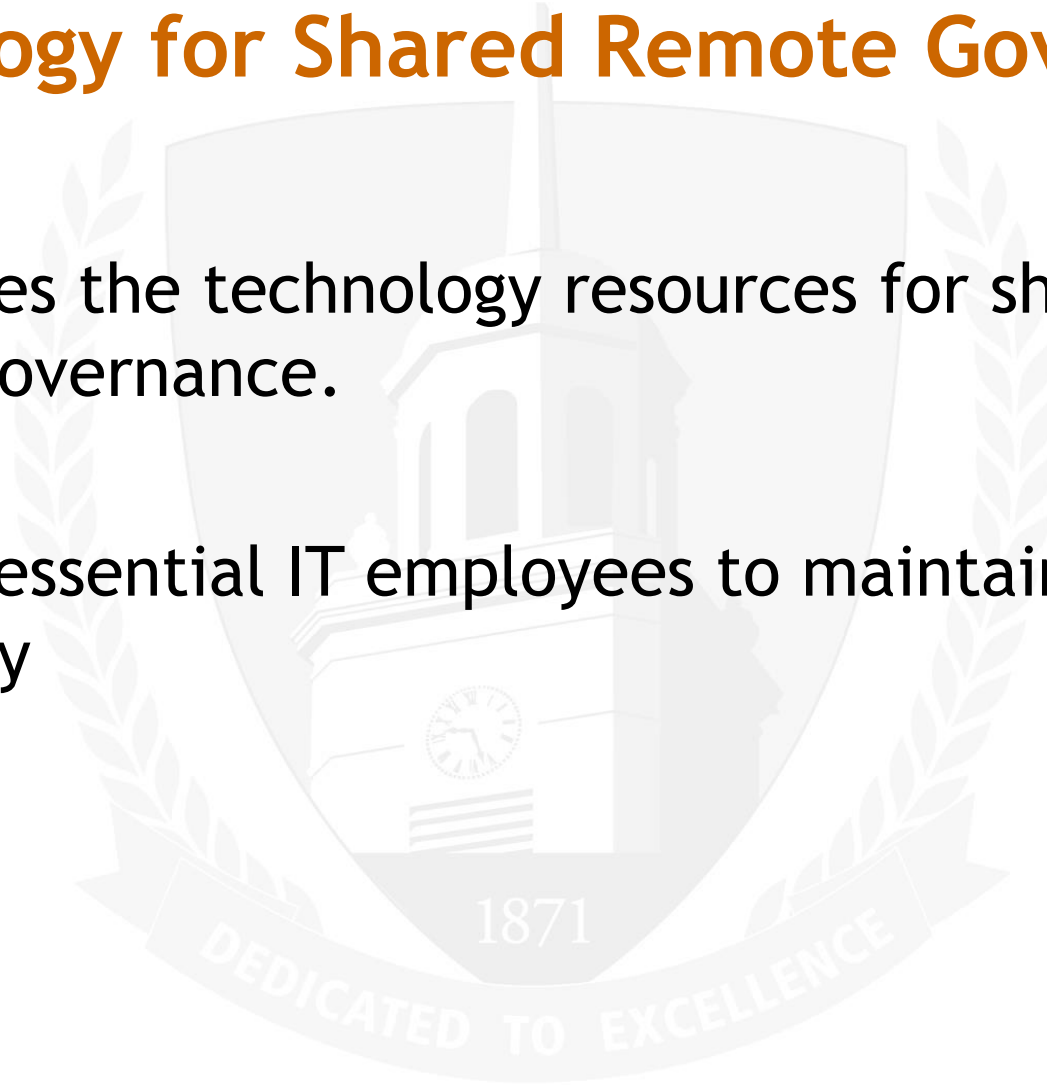


[#BuffStateStrong](#)

Thank You to All Our Unsung Heroes at Buffalo State College

# Technology for Shared Remote Governance

- IT provides the technology resources for shared remote governance.
- Vital for essential IT employees to maintain continuity



# Thank you UPD - Unsung heroes



- IT provides electronic access control
- UPD utilizes the video camera network.
- Remote access to the campus & police networks.



#BuffStateStrong

Thank You to All Our Unsung Heroes at Buffalo State College

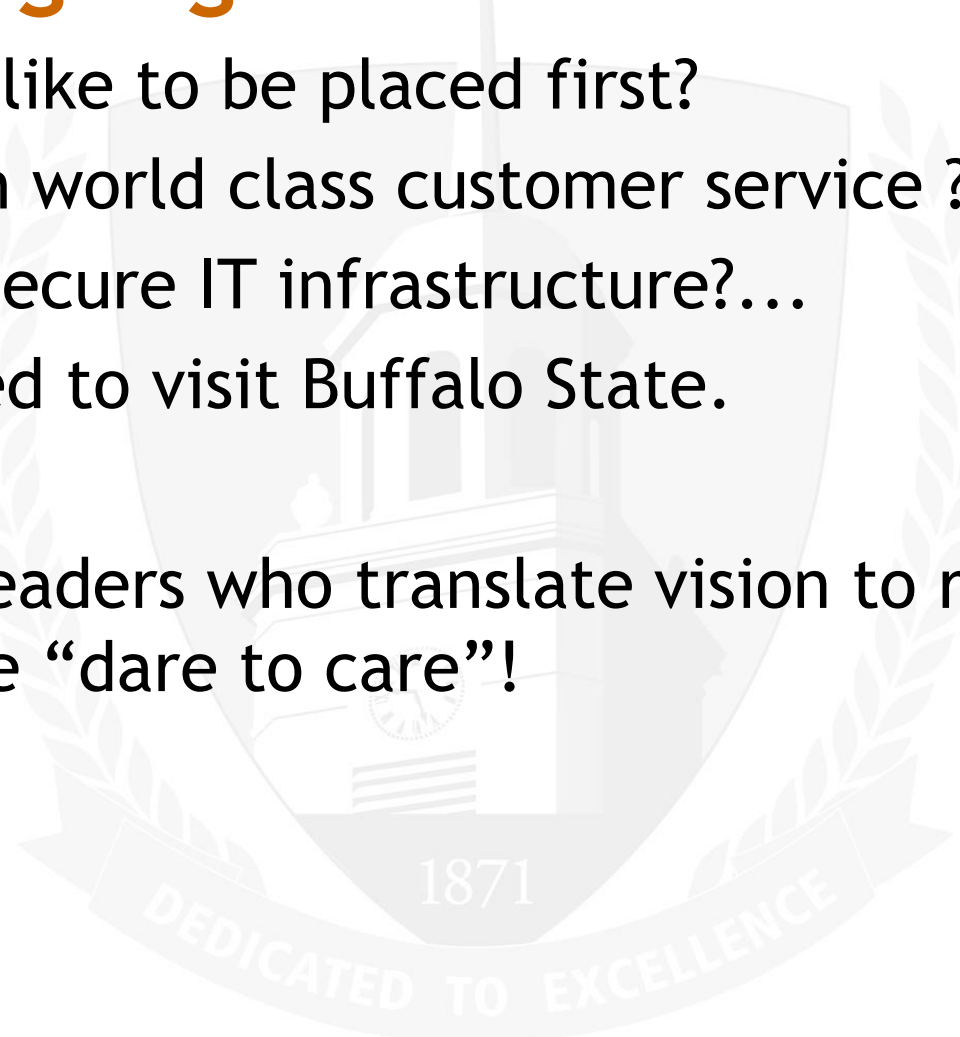
- Outdated alarm system to a new Access Control System.
- VOIP, voice recording system & radio transmissions
- Parking and dispatch servers
- Student safety is our 1st priority.

# Working together because we care

- Would you like to be placed first?
- To be given world class customer service ?
- To have a secure IT infrastructure?...

Then you need to visit Buffalo State.

- Effective leaders who translate vision to reality because we “dare to care”!





**Believe, Inspire and Achieve**  
**I see you, I appreciate you, and I thank you...**



THANK YOU!



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# Resource links:

- <https://sunysail.org/about-sail/cio-leadership-academy/>
- <https://cce.buffalostate.edu/bengalsdaretocareday>
- <https://undergraduateresearch.buffalostate.edu/srcc>
- <https://cce.buffalostate.edu/volunteer-information-during-coronavirus-covid-19-crisis>
- <https://www.burchfieldpenney.org/>
- <https://library.buffalostate.edu/renovation>
- <https://suny.buffalostate.edu/strategicplan>
- <https://it.buffalostate.edu/strategic-plan>
- [https://www.youtube.com/watch?v=UlrOjh6HggM&feature=share&fbclid=IwAR2QQMzgDXWvCmbIMJbusnp53DJJhSgymZaNK2CErgS0N2adPaN\\_Y5v-AB4](https://www.youtube.com/watch?v=UlrOjh6HggM&feature=share&fbclid=IwAR2QQMzgDXWvCmbIMJbusnp53DJJhSgymZaNK2CErgS0N2adPaN_Y5v-AB4)