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# NAIIR Lab

ANNUAL NEWSLETTER



## LETTER FROM *Dr. Nair*



Dear Friends of the NAIIR lab,

As the year draws to a close, we would like to take a moment to express our heartfelt gratitude to you for your invaluable contributions to our research efforts. Your participation plays a pivotal role in advancing our understanding of the neural and behavioral correlates of autism and co-occurring conditions and helps pave the way for meaningful progress that benefits communities worldwide.

This year, thanks to your involvement, we have made significant strides, including the ones highlighted below in this newsletter. These achievements would not have been possible without your time, effort, and willingness to share your experiences and insights. We understand that participating in research often requires personal commitment, and we are deeply appreciative of the trust you place in us.

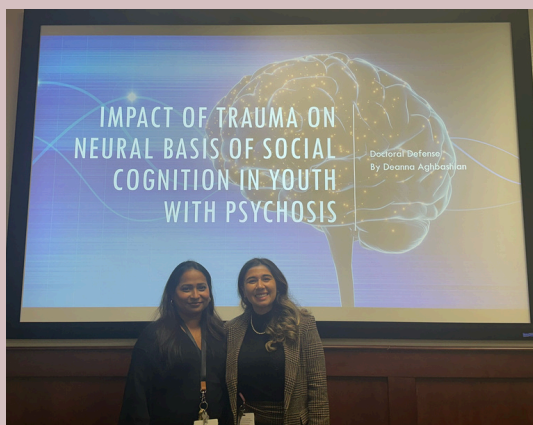
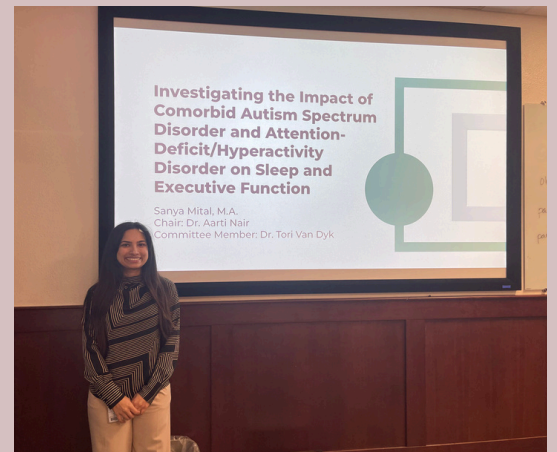
As we look ahead to another year of discovery and innovation, we are excited about the possibilities that lie ahead and remain committed to keeping you informed about the progress of our work. Your continued support inspires us to reach new heights. Thank you once again for being an essential part of our journey. We wish you and your loved ones a joyful holiday season and a prosperous New Year!

# NEW GRANT

Dr. Nair and Dr. Bartnik-Olsen from Department of Radiology recently received the Loma Linda University Grant for Research and School Partnerships (GRASP)! This will allow for our team to assess the neural basis of sleep disturbances and its impact on behavioral functioning in autistic youth ages 6 to 18 years. The study is actively recruiting autistic youth and typically developing peers! Select participants may also be eligible for a paid MRI scan.

# DISSERTATION DEFENSE

Congratulations to our doctoral student Sanya on passing her dissertation defense! She looked at group diagnostic differences in sleep and executive functioning among autistic individuals and those with co-occurring autism and attention-deficit/hyperactivity disorder (ADHD). The co-occurring group presented with worse sleep and executive functioning compared to those with only autism, prompting the need for specialized intervention in such co-occurring populations.



Congratulations to our doctoral student Deanna on passing her dissertation defense on youth with psychosis! Her dissertation results revealed that trauma significantly moderated the relationship between volume and thickness of limbic cortical regions and social responsiveness and theory of mind skills, such that more childhood traumatic experiences had a stronger impact on brain architecture in these regions and poorer social cognition outcomes in youth with psychosis.

# NEW FINDINGS

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Our lab has more posters and papers that have been submitted for conferences and publishing! Check out these findings!

- Dr. Nair and doctoral student Rhideeta submitted a manuscript for scientific peer-review from their study exploring the unique functional connectivity patterns in the default mode, central executive, and salience networks among autistic adolescents and adolescents with early-onset psychosis. Their findings highlight distinct brain connectivity profiles in each group linked to unique social cognition and emotion recognition challenges, shedding light on the neural mechanisms underlying these neuropsychiatric conditions.
- Doctoral students Veronica and Laura's project shows that participating in a social skills program (PEERS) helped reduce restrictive and repetitive behaviors in autistic adolescents. It also suggests that compensatory changes in brain connectivity, particularly between areas involved in sensory processing (i.e., basal ganglia and the left lingual gyrus), may help improve how autistic adolescents respond to sensory information.
- Doctoral students Laura and Veronica's poster project explored how underconnectivity between the inferior frontal gyrus (mirror neuron system hub) and right lingual gyrus (visual area) in autistic youth following the social skills program (PEERS). These compensatory changes were associated with improvements in social perspective taking post-intervention.
- Doctoral students Jacob and Katie's poster project illustrated that anxiety-related problems were a significant mediator in the relationship between sleep difficulties and impairments in social motivation in autistic youth. This project also supported prior literature suggesting a significant association between sleep difficulties and higher anxiety-related problems as well as a significant association between anxiety-related problems and greater deficits in social motivation.
- Doctoral students Deanna and Niharika's poster project found that regular attendance and homework completion moderated the relationship between higher prefrontal cortex (social brain region) thickness and better emotion recognition skills post-intervention, suggesting that regular participation and practice of the social skills program (PEERS) may reduce the impact of structural brain differences on social cognitive abilities.

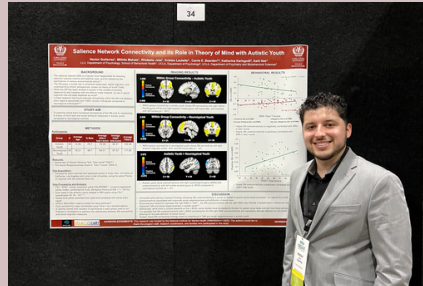




# OUR TRIP TO AUSTRALIA

Members from our team presented at the 2024 Annual Society for Autism Research (INSAR) Conference in Australia!

- Doctoral student Katie presented her findings at a sleep symposium chaired by Dr. Nair in collaboration with our Australian colleagues. Her findings suggest that children with autism and co-occurring ADHD (AuDHD) had significantly more sensory processing difficulties (e.g., avoidance), sleep-related anxiety, and challenges with impulse control than autistic children without ADHD. In general, sensory avoidance, sensitivity, and difficulties with impulse control were related to elevated sleep anxiety.
- Doctoral student Mithila and lab manager Hector presented on how potential compensatory overconnectivity of the Central Executive Network (network involved in attention orientation and cognitive control) was associated with better reciprocal social behaviors and social perception abilities in autistic youth compared to neurotypical youth.
- Lab manager Hector and doctoral student Mithila also presented on how overconnectivity of the Salience Network (network involved in detecting stimuli and attentional prioritization) was associated with improved social responsiveness and attribution of social cues in autistic youth compared to neurotypical youth.



# MEMBER SPOTLIGHT

LAURA

*Project Coordinator*

We want to highlight our doctoral student and SENSE project coordinator, Laura. Laura is a 3rd year PhD student specializing in brain correlates of autism symptomatology. She is also an excellent bilingual clinician-in-training poised to serve so many families in need of her specialized skills. Thank you for everything you do for us! We are very lucky to have you on our team!



## RECRUITMENT

The research highlighted above wouldn't have been possible without the important time and effort contributed by you and your child. We greatly appreciate your participation in our studies!

If you know anyone who may be a good fit for our studies, please share the flyer with them

### DO YOU HAVE A CHILD WITH AUTISM SPECTRUM?

#### Participate in an LLU research study!

##### Your child may be eligible if they

- Are between ages 6-18
- Are fully verbal



##### Participation involves

- Questionnaires and interviews
- \$70 for assessment visit
- Wearing actigraph for 14 consecutive days
- \$80 if worn all 14 days and filled out each daily survey
- Additional \$50 for an MRI scan for eligible participants over age 10



For more information, call LLU at 909-494-2495 or scan the QR code below to send us an email!



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