

# THEORY LECTURE SERIES: Non-equilibrium field theory for everyone!

MOHAMMAD MAGHREBI

January 16, 2024 to January 30, 2024

10:00 to 12:00

Blue Lecture Room

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## **Abstract:**

Field-theoretical techniques are immensely useful for understanding the nature of quantum (and classical) many-body phases and their universal, critical behaviour at their phase transitions. While these techniques are well established in equilibrium, their extension and application to non-equilibrium systems is often viewed to be notoriously complicated. In these lectures, I will provide a friendly (and slightly unconventional) introduction that starts with more familiar concepts and techniques, with a focus on some paradigmatic models of quantum optics. I will discuss the advantages of field theory techniques compared to alternative methods. Finally, I argue that, beyond their formal applications, field theory techniques can provide an efficient numerical approach to the dynamics based on stochastic sampling.?

## **Biography:**

Professor Mohammad Maghrebi received his PhD from MIT in 2013. After a postdoctoral appointment at the Joint Quantum Institute in the University of Maryland, he joined Michigan State University in 2017 where he is now an Associate Professor of Physics. He has won multiple early-career awards including the NSF CAREER Award as well as the Young Investigator Award. His expertise lies in the dynamics of many-body quantum systems, open driven systems, long-interacting quantum systems among others. In particular, he has extensively applied field theory techniques to many-body quantum systems.

Participation is open to all ICFOnia

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d. Scheduled to take place in **tB&R** on **January 16, 23, 30** from **10:00h to 12:00h**.

**Hosted by:** Academic Affairs