ASU School of Mathematical
and Statistical Sciences

Arizona State University

M E M O R A N D U M

DATE: March 21, 2022
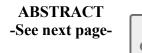
TO: Faculty and Students

FROM: Professor(s)   <u>Sebastien Motsch</u>

Chair/Co-Chairs of   <u>Fei Cao</u>

Defense for the   <u>PhD</u>   in   <u>Applied Mathematics</u>

Committee Members   <u>Donald Jones</u>

<u>John Fricks</u>

<u>Nicolas Lanchier</u>

<u>Paul Hahn</u>

DEFENSE ANNOUNCEMENT

Candidate: <u>Fei Cao</u>

Defense Date: <u>03/30/2022</u>

Defense Time: <u>2:00</u>   <u>PM</u>

Virtual Meeting Link: <u>https://asu.zoom.us/j/86827427944</u>

Title: <u>From stochastic N particle systems to deterministic differential equations - with applications to econophysics and averaging dynamics</u>

Please share this information with colleagues and other students, especially those studying in similar fields. Faculty and students are encouraged to attend. The defending candidate will give a 40 minute talk, after which the committee members will ask questions. There may be time for questions from those in attendance. But, guests are primarily invited to attend as observers and will be excused when the committee begins its deliberations or if the committee wishes to question the candidate privately.

ABSTRACT
-See next page-

Abstract

The mechanisms behind the emergence of collective behaviors arising from physics, biology, economics and many other related fields have drawn a lot of attention among the applied math community in the last few decades. Broadly speaking, collective behaviors in natural, life and social sciences are all modelled by interacting particle systems, in which a bulk of N particles are engaging in some simple binary pairwise interactions. In this dissertation, some prototypical interacting particle systems having applications in econophysics and statistical averaging dynamics are investigated. It is also emphasized that there is an increasing tendency among the applied math community to apply tools or concepts for studying many particle systems to the (rigorous) investigation of artificial (deep) neural networks.