Meeting Synopsis
Research on human performance tends to emphasize the individual. But even for activities outside of team sports and specialized military units, human performance occurs in the context of groups. For example, although the marathon is an individual event, runners tend to cluster and synchronize their pace. Furthermore, all competitions occur within a social environment and many times that social environment has a distinct culture thought to influence aspects of performance, from the successful implementation of strategy to willingness to adopt novel methods. Indeed, on example is variation in willingness to adopt a quantitative approach to sports analytics is an example. Teams and individual players are often described as having streaks of either poor or outstanding performance. To what extent are the physiological changes underlying these above-and-below-baseline performances mediated by collective dynamics on the field itself, synergisms among players, team mood and team culture? Can optimal configurations of players be reliably identified? How does the importance of configuration change as a function of how synergistic or collective (versus additive) performance is—for example, does configuration matter more in basketball than in baseball and can we quantify this? How decomposable is team performance into individual contributions?

In this working group we will bring together a diverse group of researchers spanning applied mathematics, information theory, statistical physics, collective behavior and intelligence, machine learning, organizational behavior, decision making, cognitive neuroscience, physiology, anthropology, and sports analytics to identify key questions around how collective dynamics influence individual and team performance. The issues we will discuss will be general and should apply to problems across a variety of fields from biology to economics. However to ground the discussion we will focus on performance in the context of sports, where increasingly, data are available at multiple scales (behavioral, aggregate and neurophysiological) and game parameters can in principle be quantified.

The questions identified as critical by this working group will form the basis for a larger workshop planned for the summer of 2019 that will bring together scientists and practitioners.

Funds to support this working group have been generously provided by Bill Miller through the Omega Program.

Talks
We’d like this meeting to be informal and discussion heavy but it is a diverse group so we need to lay the foundations first—we are asking each speaker to either lay out the challenges as he or she sees them with respect to exploring the importance of collective effects OR to
introduce a set of methods from the study of collective behavior that could potentially be of use. The talks should not be work talks but should be fun and forward looking.

At the end of each “session”, we have designated a discussion leader who should make a few provisional remarks and get the discussion going around themes common to that session and, when possible, running across sessions. Please aim for 20 minute “talks” with 10 minutes of specific discussion.

Agenda

Monday June 25
8:30AM Continental breakfast at SFI
9:00AM Introductions around the room

Big Picture Meeting Issues
9:15AM Jessica Flack
9:45AM John Krakauer
10:15AM Michael Mauboussin
10:45AM Coffee Break
11:00AM Brian Ferguson
11:30AM Discussion of common themes led by Cade Massey
12:30PM Lunch

Chemistry & Synergy
1:30PM Cade Massey
2:00PM David Krakauer
2:30PM Coffee Break
2:45PM Dean Oliver
3:15PM Simon Garnier
3:45PM Caterina DeBacco
4:15PM Discussion of common themes led by Jessica Flack
5:00/5:15PM Adjourn
7:00PM Dinner at restaurant TBD

Tuesday June 26
8:30AM Continental breakfast at SFI

Physical & Mental Limits
9:00AM Alex Hutchinson
9:30AM Michael Joyner
10:00AM Coffee Break
10:15AM Steve Magness
10:45AM Geoffrey West
11:15AM Discussion of common themes led by John Krakauer
12:00 PM Lunch
Streaks & Flow
1:30PM Steve Kotler
2:00PM Joshua Miller
2:30PM Coffee Break
2:45PM Bill Miller
3:15PM Sid Redner
3:45PM Discussion of common themes led by Michael Mauboussin

4:45PM Adjourn—self organize for dinner

8:30PM Drinks for anyone interested at location to be announced

Wednesday June 27
8:30AM Continental breakfast at SFI

Synchronicity & Coordination
9:00AM Christine Legare
9:30AM Adam Russell
10:00AM Kevin O'Keeffe
10:30AM Coffee Break
10:45AM Bryan Daniels
11:15AM Andrew Berdahl
11:45AM Discussion of common themes in this session and across meeting led by David Krakauer

12:30PM Lunch

2:00PM Group discussion & planning for 2019 meeting led by Jessica & John

4:30PM Adjourn