



Pathways, Memory, and Emergent Computation in Nonequilibrium System

Sede Boqer, Israel

Sunday, May 7

17:00-17:45 Bus from Beer Sheva University Train Station to Sede Boqer

18:30-19:30 Dinner

Monday, May 8

07:30-09:30 Breakfast (for those arriving on Sunday)

09:50-10:35 Bus from Beer Sheva University Train Station to Sede Boqer

11:00-11:10 Opening

11:10-11:50 Nathan Keim, Facets of memory in experiments with a jammed solid

11:50-12:30 Karen Daniels, Mechanical memory in 1D

12:30-13:00 Discussion

13:00-14:00 Lunch

14:30-15:10 Daniel Hexner, Training viscoelastic material

15:10-15:50 Frédéric Lechenault, Writing memory in model glass with AI

15:50-16:20 Discussion

16:20-16:40 Break

16:40-18:00 Contributed Talks:

Martin Falk, Contrastive learning through non-equilibrium memory

Himangsu Bhaumik, Understanding the failure of material training

Marc Berneman, Training dynamics in disordered spring networks

Dominique Chu, Information theoretical properties of a spiking neuron trained with Hebbian and STDP learning rules

Gianluca Martini, Generalizing the perceptron: random-assembled nanostructured films for unconventional data processing

18:30-19:30 Dinner

19:30-23:00 Stargazing in Ramon Crater

Tuesday, May 9

07:30-09:00 **Breakfast**

09:00-09:40 Muhittin Mungan, Memory formation in driven disordered systems: Dead or alive

09:40-10:20 Charles Reichhardt, Clogging, memory and random organization with quenched disorder

10:20-10:50 Discussion

10:50-11:10 **Break**

11:10-11:50 Karin Dahmen, Simple models for avalanches and memory

11:50-12:30 Dor Shohat, Global vs local signatures of memory formation in disordered systems

12:30-13:00 Discussion

13:00-14:00 **Lunch**

14:30-17:00 Hike and visit to Ein Avdat

18:30-19:30 **Dinner**

Wednesday, May 10

07:30-09:00 **Breakfast**

09:00-09:40 Menachem Stern, Physical learning in and out of equilibrium

09:40-10:20 Sri Sastry, Enhanced memory and learning with active dynamics

10:20-10:50 Discussion

10:50-11:10 **Break**

11:10-12:30 Contributed Talks:

Chaviva Sirote, Emergent disorder and mechanical memory in periodic metamaterials

Colin Meulblok, Subharmonic orbits via coupled beams

Paul Baconnier, Exploring the transition-graphs of interacting hysterons from the top-down & bottom-up

Moshe Schechter, Strongly and weakly interacting two level systems in amorphous solids out of equilibrium

Debjyoti Majumdar, Dynamics of amorphous system subject to time-dependent oscillatory shear at finite temperature and frequencies

12:30-14:00 **Lunch**

15:00-15:40 Chloe Lindeman, Memory and rheology in jammed packings

15:40-16:20 Ido Regev, The contribution of overlaps between plastic events to irreversible dynamics in cyclically sheared amorphous solids

16:20-16:50 Discussion

18:30-21:00 Bedouin Dinner at Desert Ship Khan

Thursday, May 11

07:30-09:00 Breakfast

09:00-09:40 Itamar Procaccia, Training, memory and universal scaling in amorphous frictional granular matter

09:40-10:20 Damien Vandembroucq, Memory effects in mesoscopic models of amorphous plasticity

10:20-10:50 Discussion

10:50-11:10 Break

11:10-11:50 Yasmine Meroz, Proving temporal integration reveals that plants sum and subtract stimuli over different timescales

11:50-12:10 Discussion

12:10-13:40 Lunch

13:40-14:20 Martin van Hecke, Emergent computing in non-Abelian metamaterials

14:20-14:40 Discussion

14:40-15:00 Conclusions

15:30-16:15 Bus from Sede Boqer to Beer Sheva University Train Station

18:30-19:30 Dinner (for those staying until Friday)

Friday, May 12

07:30-09:30 Breakfast

09:00-09:45 Bus from Sede Boqer to Beer Sheva University Train Station