Department of Mathematics, BGU

Colloquium

On *Tuesday, January ,6 2026*

At *14:30 – 15:30*

In *Math 101-*

Michael Schein (BIU)

will talk about

Ramfiications of local-global compatibility in the mod p local Langlands correspondence

Abstract: The mod p local Langlands correspondence is expected to associate, in a functorial manner, a representation \pi(r) of the group GL_n(F) over a field of characteristic p to every n-dimensional mod p representation r of the absolute Galois group of F; here F is a p-adic field. The correspondence is only known for GL_2(Q_p). It is natural to expect it to be realized in the mod p cohomology of Shimura varieties, but any such construction of \pi(r) depends on many global choices and, apart from the case of GL_2(Q_p), is never known to depend only on r. When F is unramfiied over Q_p and n = 2 and r is generic, it is known that certain invariants of any \pi(r) arising in cohomology depend only on r. Moreover, Breuil has defined a functor from mod p representations of GL_n(F) to representations of the absolute Galois group of Q_p. In the above case, the known invariants of \pi(r) are enough to compute its image under the functor,

which turns out to be the tensor induction of r from F to Q_p, at least up to restriction to inertia.

The talk will discuss these ideas and present some new results partially extending them to the case where F is a ramfiied quadratic extension of Q_p. The arguments are essentially orthogonal to those of the unramfiied case. A key element of the proof is the determination of (enough of) the submodule structure of mod p principal series representations of GL_2 over some finite quotients of the valuation ring of F. This structure turns out to admit a combinatorial description in terms of the columns where carries are performed when adding certain integers in base p.

The talk discusses joint works with R. Waxman and with S. Morra. Familiarity with addition with carrying will be assumed, but not familiarity with the other notions mentioned above.