EHUD DE SHALIT

Curriculum Vita

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ID : 5326951/0
Date of Birth : 16 March 1955
Place of Birth : Rehovot, Israel
Marital Status : married + 3
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Service in the IDF : 1975-1979
Languages : Hebrew, English, some French

Higher Education

dates	institution	area	degree
1980-84	Princeton University	Mathematics	Ph.D.
1972-75	Hebrew University	Mathematics-Physics	B.Sc.

Positions Held

2001-	Hebrew Univ.	Professor
1995-01	Hebrew Univ.	Associate Professor
1988-95	Hebrew Univ.	Senior Lecturer
1987-88	Hebrew Univ.	Lecturer (Alon Fellow)
1986-87	MSRI (Berkeley)	Research Assistant
1984-86	Harvard Univ.	Benjamin Peirce Assistant Prof.

Visiting Positions

1991-92	Princeton Univ.	Visiting Assistant Prof.
2004	Brown Univ.	Visiting Prof.

Also held short-term visiting positions in Univ.Paris VI, IHP and IHES (Paris), MPI (Bonn), Newton Institute (Cambridge), MSRI (Berkeley), Muenster University (Simon fellow), Oberwolfach (RIP) and Harvard University.

Grants

- NSF grant #DMS 86-03949 (1986)
- Grant from the Israel Academy of Arts and Science for research in *p-adic methods in number theory and group theory* (together with A. Lubotzky and R. Livné) (1990-1993)
- BSF grant #92-00188 for research on *Modular forms, Galois representations and p-adic analysis* (together with R. Livné, R. Coleman and B. Jordan) (1993-1996)
- Grant from the Israel Academy of Arts and Sciences #136/96-1 for research on *Special values of theta functions* (1996-1999).
- Grant from the Israel Academy of Arts and Sciences #303/02-1 for research on *P-adic uniformization, cohomology, and harmonic analysis on buildings* (2002-2005).
- Russia-Israel Sceintific Research Cooperation on *Local and global fields and algebraic groups over them,* project #3-3578 (2006-2008).
- Grant from the Israel Academy of Arts and Sciences #669-07 for research on *Arithmetic and geometric applications of p-adic uniformization* (with R. Livné) (2007-2011).
- Grant from the Israel Academy of Arts and Sciences #276-17 for research on *Geometry and arithmetic of Picard modular surfaces* (2017-2021).

Awards

- Alon fellowship (1987).
- The Milken Prize for excellence in teaching (2000).

Editorial

- Editor, Israel Journal of Mathematics (1997-).
- Editor, Transactions of the AMS (2021-).

Special Duties

- Director, the Landau Center for Research in Mathematical Analysis and Related Areas (1999-2002)
- Local coordinator, the Jerusalem node of the European network in Arithmetic Algebraic Geometry (2000-2003).
- Chairman of the Institute of Mathematics at the Hebrew University (2006-2009, 2015-2016).

Ph.D. Theses supervised

"Units in abelian extensions of CM fields of degree 4", by Eyal Goren (1996).

"Modular symbols and p-adic analysis of modular curves", by Assaf Goldberger (2000).

"Geometry of p-adic symmetric spaces", by Gil Alon (2003).

"Applications of Homotopy Theory to the study of Obstructios to the Existence of Rational Points", by Tomer Schlank (2012).

"Existence of invariant norms in p-adic representations of reductive groups", by Eran Assaf (2016).

"Integral structures and invariant norms in p-adic representations", by Amit Ophir (2022).

M.Sc. Students

Eyal Goren, Yves Godin, Tonio Peres, David Lehavi, Sefi Ladkani, Assaf Goldberger, Gil Alon, Shelly Gerion, Menachem Aka, Eran Iceland, Shaul Zemel, Amit Ophir, Gal Porat, Nadav Gropper, Gil Livne.

Talks at Conferences

- Invited speaker, ICM2006, session on mathematical education.

List of Publications

[0] *Ph.D. thesis* : *"On p-adic L functions associated with CM elliptic curves, and arithmetic applications"*, Princeton, June 1984. Thesis advisor : A. Wiles.

[1] Relative Lubin-Tate groups, *Proc. A.M.S.* **95** (1985), 1-4.

[2] The explicit reciprocity law in local class field theory, *Duke Math. J.* **53** (1986), 163-176.

[3] *Iwasawa Theory of Elliptic Curves with Complex Multiplication*, Perspectives in Mathematics, vol. 3, Academic Press, Boston, 1987 (154 p.)

[4] Making class field theory explicit, *CMS conference proceedings, vol.* **7** (1987), 55-58.

[5] On monomial relations between p-adic periods, *J. fur die reine und angewandte Mathematik* **374** (1987), 193-207.

[6] P-adic regulators on curves and special values of p-adic L functions (with R. Coleman), *Invent. Math.* **93** (1988), 239-266.

[7] A formula for the cup product on Mumford curves, *Publ. de theorie de nombres de Bordeaux* (1988), 47/1-10.

[8] A note on norm-coherent units in certain $\mathbb{Z}_p$ -extensions, *in : Advanced Studies in Pure Math., vol.* **17**, *Academic Press, Tokyo* (1989), 83-87.

[9] Eichler cohomology and periods of modular forms on p-adic Schottky groups, *J. fur die reine und angewandte Mathematik* **400** (1989), 3-31.

[10] Differentials of the second kind on Mumford curves, *Israel J. of Math.* **71** (1990), 1-16.

[11] Artin-Schreier-Witt extensions as limits of Kummer-Lubin-Tate extensions, and the explicit reciprocity law, *in : The Arithmetic of Function Fields, edts. D. Goss et al., Walter de Gruyter, Berlin* (1992), 413-420.

[12] A note on the Shimura subgroup of $J_0(p)$, *J. of Number Theory,* **46** (1994), 100-107.

[13] Kronecker's polynomial, supersingular elliptic curves, and p-adic periods of modular forms, *Contemporary Math.* **165** (1994), 135-148.

[14] The explicit reciprocity law of Bloch-Kato, *Asterisque,* **228** (1995), 197-221.

[15] On the p-adic periods of $X_0(p)$, *Math. Annalen* **303** (1995), 457-472.

[16] On certain Galois representations related to the modular curve $X_1(p)$, *Compositio Math.* **95** (1995), 69-100.

[17] P-adic periods and modular symbols of elliptic curves of prime conductor, *Invent. Math.* **121** (1995), 225-255.

[18] Metabelian local class field theory (with H. Koch), *J. fur die reine und angewandte Mathematik* **478** (1996), 85-106.

[19] On special values of theta functions of genus two (with E. Goren), *Annales de l'Inst. Fourier* **47** (1997), 775-799.

[20] Hecke rings and universal deformation rings (a survey paper), *in Modular Forms and Fermat's Last Theorem, edts. G. Cornell et al., Springer-Verlag, Berlin* (1997), 21 p.

[21] Residues on buildings, and de-Rham cohomology of p-adic symmetric domains, *Duke Math. J.,* **106** (2000), 123-191.

[22] *Appendix to*: Congruences of Néron models for tori and the Artin conductor, by Ching-Li Chai and Jiu-Kang Yu, *Annals of Math.,* **154** (2001), 347-382.

[23] Tamely ramified Hida theory (with Assaf Goldberger), *Annales de l'Inst. Fourier* **52** (2002), 1-45.

[24] On the cohomology of Drinfeld's p-adic symmetric domain (with Gil Alon), *Israel J. Math.* **129** (2002), 1-20.

[25] Cohomology of discrete groups in harmonic cochains on buildings (with Gil Alon), *Israel J. of Math.* **135** (2003), 355-380.

[26] Artin L-functions (a survey paper), in: *An Introduction to the Langlands Program,* J.Bernstein, S. Gelbart editors, Birkhauser (2003), 73-88.

[27] Elliptic curves and l-adic representations (a survey paper), in: *An Introduction to the Langlands Program,* J.Bernstein, S. Gelbart editors, Birkhauser (2003), 89-108.

[28] The p-adic monodromy weight conjecture for p-adically uniformized varieties, *Compositio Math.* **141** (2005), 101-120.

[29] Coleman integration versus Schneider integration on semistable curves, *Documenta Math.*, Extra volume in honor of John Coates' sixtieth birthday (2006), 325-334.

[30] On tensor products of semistable lattices (with Ori Parzan), *preprint* (2006), *arXiv*: **1211.3454**.

[31] Integer valued polynomials and Lubin-Tate formal groups (with Eran Iceland), *J. Number Theory* **129** (2009), 632-639.

[32] Bounded cohomology of the p-adic upper half plane, in: *Symmetries in Algebra and Number Theory*, I.Kersten, R.Meyer, edts., Goettingen (2009), 27-47.

[33] $\mathcal{L}$-invariants and p-adic special series (d'aprés Breuil), *preprint* (2010).

[34] Kirillov models and integral structures in p-adic smooth representations of $GL_2(F)$ (with David Kazhdan), *J. of Algebra* **353** (2012), 212-223.

[35] Kirillov models and the Breuil-Schneider conjecture for $GL_2(F)$ (with Eran Assaf and David Kazhdan), *arXiv:***1302.3060** (2013).

[36] Mahler bases and elementary p-adic analysis, *J. de Théorie des Nombres de Bordeaux* **28** (2016), 597-620.

[37] $\mathcal{L}$-invariants of p-adically uniformized varieties (with Amnon Besser), *Annales Math. du Quebec* **40(1)** (2016), 29-54.

[38] A theta operator on Picard modular forms modulo an inert prime (with Eyal Z. Goren), *Research in the Math. Sciences, a special volume in memory of Robert Coleman* **3**:28 (2016), 1-65, *arXiv:* **1412.5494**.

[39] Supersingular curves on Picard modular surfaces (with Eyal Z. Goren) *Journal of Number Theory* **171** (2017), 391-421, *arXiv:* **1607.04170**.

[40] q-binomials and non-continuity of the p-adic Fourier transform (with Amit Ophir) *Quarterly J. of Math.* **67** (2016), 653-668, *arXiv:* **1607.03670**.

[41] On the bad reduction of certain $U(2,1)$ Shimura varieties (with Eyal Z. Goren), in: *Geometry, Algebra, Number Theory, and Their Information Technology Applications*, A. Akbary and S. Gun (Editors), 2016, Springer Proceedings in Mathematics and Statistics Series (2017), 81-152, *arXiv:* **1703.05720**.

[42] Foliations on unitary Shimura varieties in positive characteristic (with Eyal Z. Goren), *Compositio Math.* **154** (2018), 2267-2304, *arXiv:* **1707.08102**.

[43] Theta operators on on unitary Shimura varieties (with Eyal Z. Goren), *Algebra and Number Theory* **13** (2019), 1829-1877, *arXiv:* **1712.06969**.

[44] Induction and restriction of (ϕ, Γ)-modules (with Gal Porat), *Muenster J. Math.* **12** (2019), 215-237, *arXiv:* **1805.08103**.

[45] Criteria for periodicity and an application to elliptic functions, *Canadian Math.Bull.*, published online 14 August 2020, pp. 1-11, *arXiv:* **2001.11726**.

[46] Elliptic (p,q)-difference modules, *Algebra and Number Theory*, **15** (2021), 1303-1342. *arXiv:* **2007.09508**.

[47] On the structure of certain Γ-difference modules (with José Ibrahim Villanueva Gutiérrez), *L'Enseignement Math.* **68** (2022), 341-377. *arXiv:* **2012.12353**.

[48] The Fargues-Fontaine curve and p-adic Hodge theory (survey), *in: Perfectoid Spaces, D. Banerjee et al. (eds.)*, 245-347, Springer, 2022.

[49] Foliations on Shimura varieties in positive characteristic (with Eyal Z. Goren), *to appear in J. Alg. Geom. arXiv:* **2205.00702**.

[50] Algebraic independence and difference equations over elliptic function fields, *submitted. arXiv:* **2207.13377**.

Grouped by subject*:*

Local fields and local class field theory: [1], [2], [4], [11], [14], [18], [31], [36]

Iwasawa theory and p-adic L functions: [0], [3], [6], [8]

Complex multiplication: [0], [3], [5], [19]

p-adic theory of modular curves and Shimura varieties: [12], [13], [15], [16], [17], [23], [38], [39], [41], [42], [43], [49]

Rigid analysis and p-adic cohomologies: [6], [7], [9], [10], [21], [24], [25], [28], [29], [32], [33], [37]

Representations of p-adic groups, p-adic Galois representations and p-adic analysis: [34], [35], [40], [44]

Difference equations: [45], [46], [47], [50]

Surveys: [20], [26], [27], [48]

Others: [22], [30]

On Mathematical Education

[E1] Was there anything wrong in the old system? in Hebrew, *Hed Hachinuch,* 3/02).

[E2] Controversial issues in K-12 mathematical education (with M. Artigue and A. Ralston) *Proceedings of the ICM,* Madrid (2006).

[E3] The Steiner tree: an implementation of physical principles in the solution of a mathematical problem, in Hebrew, *Tehuda,* **28**, 1-2 (2009).

[E4] Reflections on Collaboration Between Mathematics and Mathematics Education (with P. Thompson, M. Artigue and G. Toerner) *in*: Mathematics and Mathematics Education: Searching for Common Ground, A Symposium in Honor of Ted Eisenberg, M.N. Fried, T. Dreyfus (eds.), Advances in Mathematics Education, Springer 2014.

Popular

[P1] Prime numbers - why are they so exciting? *Frontiers of Young Minds,* published online 9/18, DOI: 10.3389/frym.2018.00040.