

REFERENCES FOR THE MINI COURSE ON SMALE SPACES, TILINGS, AND THEIR C^* -ALGEBRAS

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REFERENCES

- [1] J. Anderson and I.F. Putnam, *Topological invariants for substitution tilings and their C^* -algebras*, Ergodic Th. and Dynam. Sys. **18** (1998), 509–537.
- This paper explains how tiling algebras fit into the framework of Smale spaces, defines tiling spaces as inverse limits, and constructs the cohomology groups of tiling spaces.
- [2] A. Connes, *Noncommutative Geometry*, Academic Press, London and San Diego, 1994.
- Connes' book outlines the modern viewpoint of C^* -algebras as noncommutative topological spaces. The introduction is well worth perusing to get a feel for the subject.
- [3] J. Kellendonk, *Noncommutative geometry of tilings and gap labelling*, Rev. Math. Phys. **7** (1995), 1133–1180.
- This is where Kellendonk constructs his C^* -algebra. I would recommend reading the explanatory article [4] by Kellendonk and Putnam first .
- [4] J. Kellendonk and I.F. Putnam, *Tilings, C^* -algebras, and K -theory*, in Directions in mathematical quasicrystals, CRM Mono. Ser. **13**, American Math. Society, Providence, 2000.
- Kellendonk and Putnam provide a very nice overview of tiling space C^* -algebras. I would suggest this paper is essential reading.
- [5] I.F. Putnam, *C^* -algebras from Smale spaces*, Canad. J. Math. **48** (1996), 175–195.
- In this paper Putnam constructs the so called Ruelle algebras associated with a Smale space.
- [6] I.F. Putnam, *Lecture notes on Smale Spaces*, Lecture Notes, Univ. of Victoria, 2015.
- These notes are available on Ian Putnam's webpage and provide a very readable introduction to Smale spaces.
- [7] I.F. Putnam. *A Homology Theory for Smale Spaces*, Memoirs of the A.M.S. 232, Providence, 2014.
- Putnam extends dimension groups for shifts of finite type to a homology theory for Smale spaces. There are some very nice open problems at the end and I believe there are many directions for future research that arise from Putnam's theory.
- [8] J.N. Renault, *A Groupoid Approach to C^* -algebras*, Lecture Notes in Math., vol. 793, Springer-Verlag, Berlin 1980.
- This is the seminal book on groupoid C^* -algebras.
- [9] D. Ruelle, *Thermodynamic Formalism*, Second Ed., Cambridge Univ. Press, Cambridge, 2004.

- Smale spaces are introduced and extensively studied in this book.
- [10] D. Ruelle, *Noncommutative Algebras for Hyperbolic Diffeomorphisms*, Invent. Math. **93** (1988), 1-13.
- This paper is the first construction of C^* -algebras from Smale space, as well as their equilibrium states. I believe it would be extremely interesting to see what these KMS states say about substitution tilings.
- [11] L. Sadun, *Topology of Tiling Spaces*, University Lecture Series **46**, American Mathematical Society, Providence, 2008.
- A great book to get started on tiling spaces.
- [12] S. Smale, *Differentiable Dynamical Systems*, Bull. A.M.S. **73** (1967), 747–817.
- This paper introduces Smale’s Axiom A systems..
- [13] B. Solomyak, *Dynamics of self-similar tilings*, Ergodic Th. and Dynam. Sys. **17** (1997), 695–738.
- Solomyak’s paper is among the first places where tilings are thought of as dynamical systems. Many important results appear in this paper.
- [14] M.F. Whittaker, *C^* -algebras of tilings with infinite rotational symmetry*, J. Oper. Th. **64** (2010), 299–319.
- In this paper I extend Kellendonk’s construction to tilings with infinite rotational symmetry, like the Pinwheel tiling.