# List of Topics

1. **Measure theoretic preliminaries**
   **Sections**: 2.1-2.3 and 2.5.
   **Content**: Basic notation. Borel and Hausdorff measures. Minkowski and Packing dimensions. Energy integrals and Frostman's lemma.
   *Daphné Baudeau: Nov 2*

2. **Fourier transforms**
   **Sections:** 3.4-3.8
   **Content:** The Fourier transform of Riesz kernels. Energy integrals of measures. Salem sets and Fourier dimension. Spherical and ball averages.
   *Niklas Herrigel: Nov 9*

3. **Hausdorff dimension of projections and distance sets**
   **Sections:** 4.1-4.3.
   **Content:** Projections. Distance sets. Dimension of Borel rings.
   *William William: Nov 16*

4. **Exceptional projections and Sobolev dimension**
   **Sections:** 5.1-5.3.
   **Content:** Exceptional sets for one-dimensional projections. Sobolev dimension. Higher dimensional projections.
   *Christoph Heidgress: Nov 23*

5. **Slices of measures and intersections with planes**
   **Sections:** 6.1-6.3.
   **Content:** Sliced measures and estimates for enrgy integrals. Dimensions of plane sections. Measures on graphs.
   *Leo Diedering: Nov 30*

6. **Intersections of general sets and measures**
   **Sections:** 7.1-7.2.
   **Content:** Intersection measures and energy estimates. Dimensions of intersections of sets.

7. **Cantor measures**
   **Sections:** 8.1-8.3.
   **Content:** Symmetric Cantor sets and measures. Pisot numbers and the

corresponding measures. Self-similar measures.

8. **Projections of the four-corner Cantor set**
   **Sections:** 10.1-10.4.
   **Content:** Peres–Simon–Solomyak proof. Kenyon's tilings and projections. Average length of projections.

9. **Besicovitch sets**
   **Sections:** 11.1-11.5
   **Content:** Existence and Hausdorff dimension of Besicovitch sets. Nikodym sets. Lines vs. line segments. Furstenberg sets.

10. **Bernoulli convolutions and Brownian motion**
    **Sections:** 9.1 and 12.1-12.2.
    **Content:** Absolute continuity of the Bernoulli convolutions. Facts on Brownian motion. Dimension of Brownian trajectories.