Gödel, Escher, Bach

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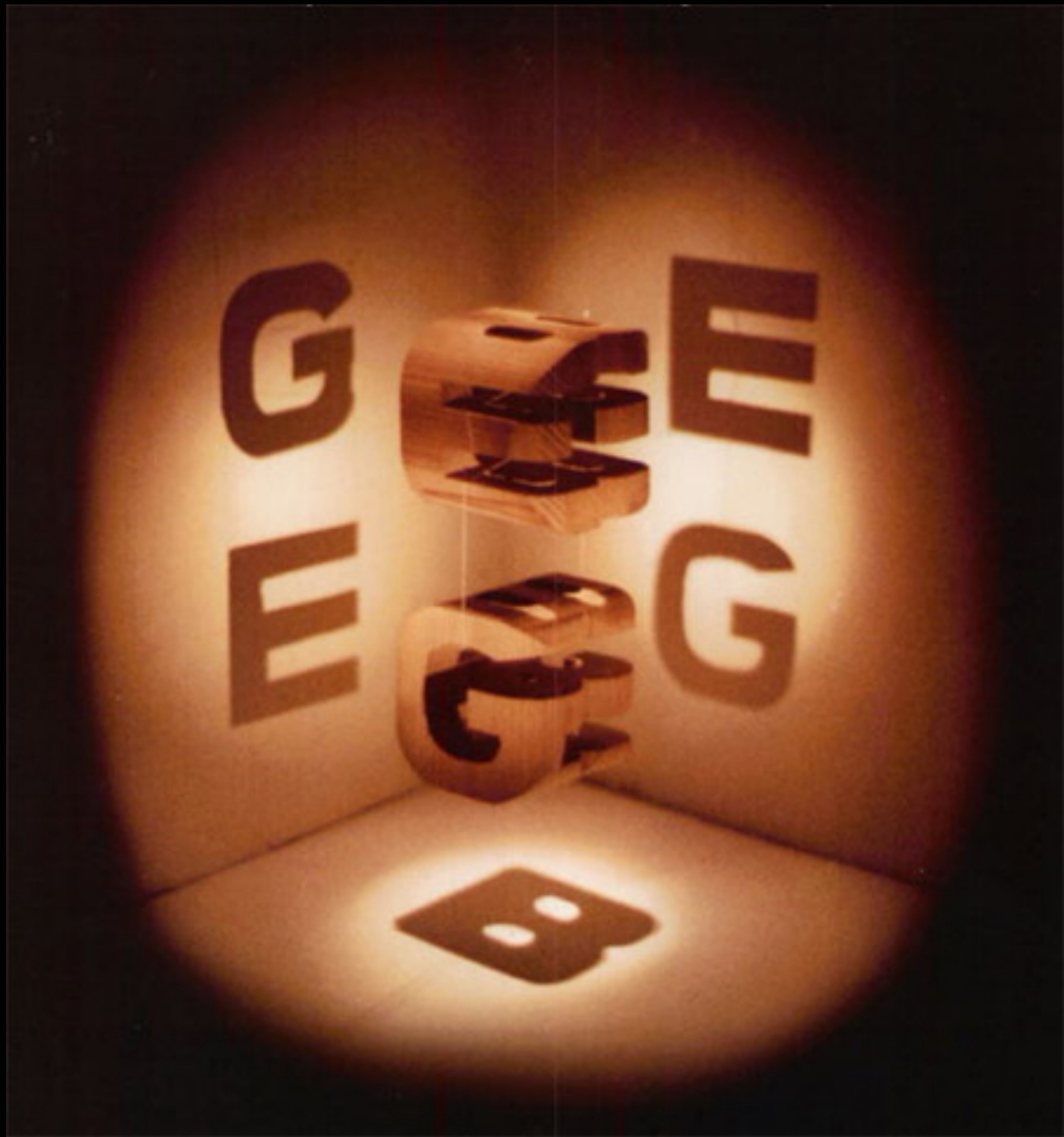
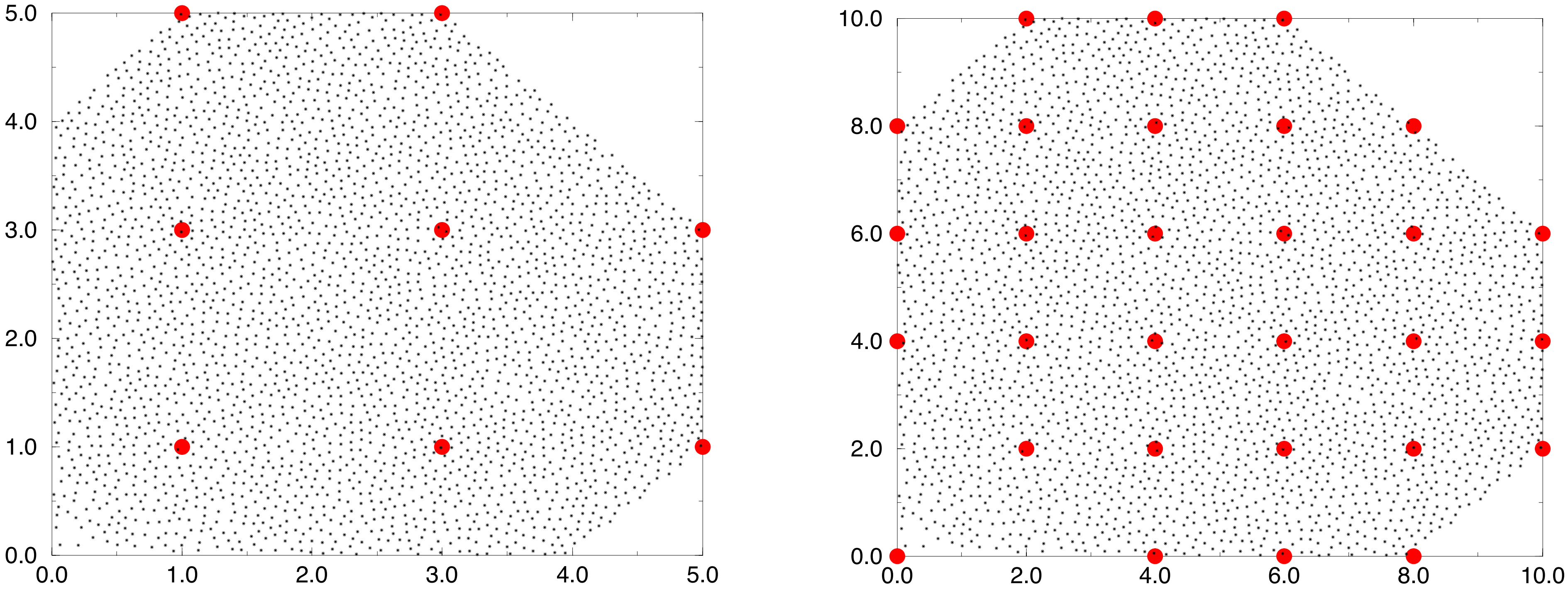
In memory of Graeme Mitchison





5.0
4.0
3.0
2.0
1.0
0.0
0.0
1.0
2.0
3.0
4.0
5.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
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10.0

Convexity, Analyticity and Graeme's method

Some preliminaries:

- Permutations will be denoted by π's so as to reserve g for $SU(d)$ elements
- I will use lowercase p for probabilities, uppercase P for projectors, and the notation $p(\lambda, \mu, \nu, \ldots)$ for the joint probability distributions

$$p(\lambda, \mu, \nu, \ldots) = \mathrm{Tr}_{A^{\otimes n} B^{\otimes n} C^{\otimes n} \ldots} \left(P_\lambda \otimes P_\mu \otimes P_\nu \ldots \rho_{ABC\ldots}^{\otimes n} \right) .$$

- Similarly, the Laplace transform of the p's will be denoted by $Z(\alpha, \beta, \gamma \ldots)$ so that

$$Z(\alpha, \beta, \gamma \ldots) = \sum_{\lambda \mu \nu \ldots} p(\lambda, \mu, \nu, \ldots) e^{-\alpha \cdot \lambda - \beta \cdot \mu - \gamma \cdot \nu \ldots} ,$$

  where $\alpha \cdot \lambda = \sum_{i=1}^{d} \alpha_i \lambda_i$.

- For rate functions, I will use ϕ and ζ so that $p \sim e^{-n\phi}$ and $Z \sim e^{-n\zeta}$. More precisely,

$$\begin{aligned} \phi(\bar{\lambda}, \bar{\mu}, \bar{\nu} \ldots) &\equiv - \lim_{n \to \infty} \frac{1}{n} \log p(n\bar{\lambda}, n\bar{\mu}, n\bar{\nu} \ldots) \\ \zeta(\alpha, \beta, \gamma \ldots) &\equiv - \lim \frac{1}{n} \log Z(\alpha, \beta, \gamma \ldots) . \end{aligned}$$