1153-46-180 **Sheldon Axler*** (axler@sfsu.edu). *Computing with Harmonic Functions.*
Fix a positive integer n and let B denote the open unit ball in $\mathbf{R}^n$.

- Dirichlet problem: Given $f \in C(\partial B)$, find the unique $u \in C(\overline{B})$ such that $u|_B$ is harmonic and $u|_{\partial B} = f$.
- Neumann problem: Given $f \in C(\partial B)$ with mean value 0, find the unique $u \in C(\overline{B})$ such that $u|_B$ is harmonic, the outward normal derivative of u on ∂B equals f, and $u(0) = 0$.

Each of the two problems above has the perhaps unexpected property that if f is a polynomial of n variables, then u is a polynomial of n variables. This talk begins by focusing on the explicit computation in closed form of the linear map $f \mapsto u$ given by each of the problems above. Then the ball is replaced by an ellipsoid, and new techniques are needed. (Received August 27, 2019)