The galaxy/black hole connection

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How the massive black holes in the centers of most galaxies first formed, grew, and interacted with their host galaxies are among the key outstanding questions in astrophysics. I will outline how the latest ground and space telescopes get us closer to the first black hole seeds and discuss a new framework for how the galaxy-black hole system as a whole operates. Building on the last decade of discovery in galaxy evolution, we are now able to ask the right questions that will ultimately lead us to the physics of how growing black holes -- quasars -- regulate and shut down the star formation in galaxies. I will outline how current and near-future facilities will answer these questions, and briefly touch how ongoing developments in machine learning can help us take astronomy to the next level.