

# Heavy exotic production mechanisms – introduction

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Exotic heavy meson spectroscopy and structure with EIC  
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# Yesterday: experimental status and future prospects

**Compass** (heavy exotic muoproduction, light exotic diffractive production, ...) – see B. Grube's talk.

**LHCb** (penta- and tetraquarks in hadronic decays, prompt production, ...) – see M. Mikhasenko's talk.

**CMS** (conventional and exotic hadron spectroscopy,  $X(3872)$ , di- $J/\psi$ , ...) – see A. Pompili's talk.

**BES III** (heavy-meson production in electron-positron collisions, ...) – see G. Mezzadri's talk.

**BELLE II** (quarkonium in B decays, direct electron-positron production, ...) – see B. Fulsom's talk.

**GlueX and CEBAF upgrade** (light-meson, charmonium, open-charm photoproduction, ...) – see S. Dobb's talk.

# Led to good discussions...

... about different production mechanisms

and the uniqueness of different experiments/the EIC.

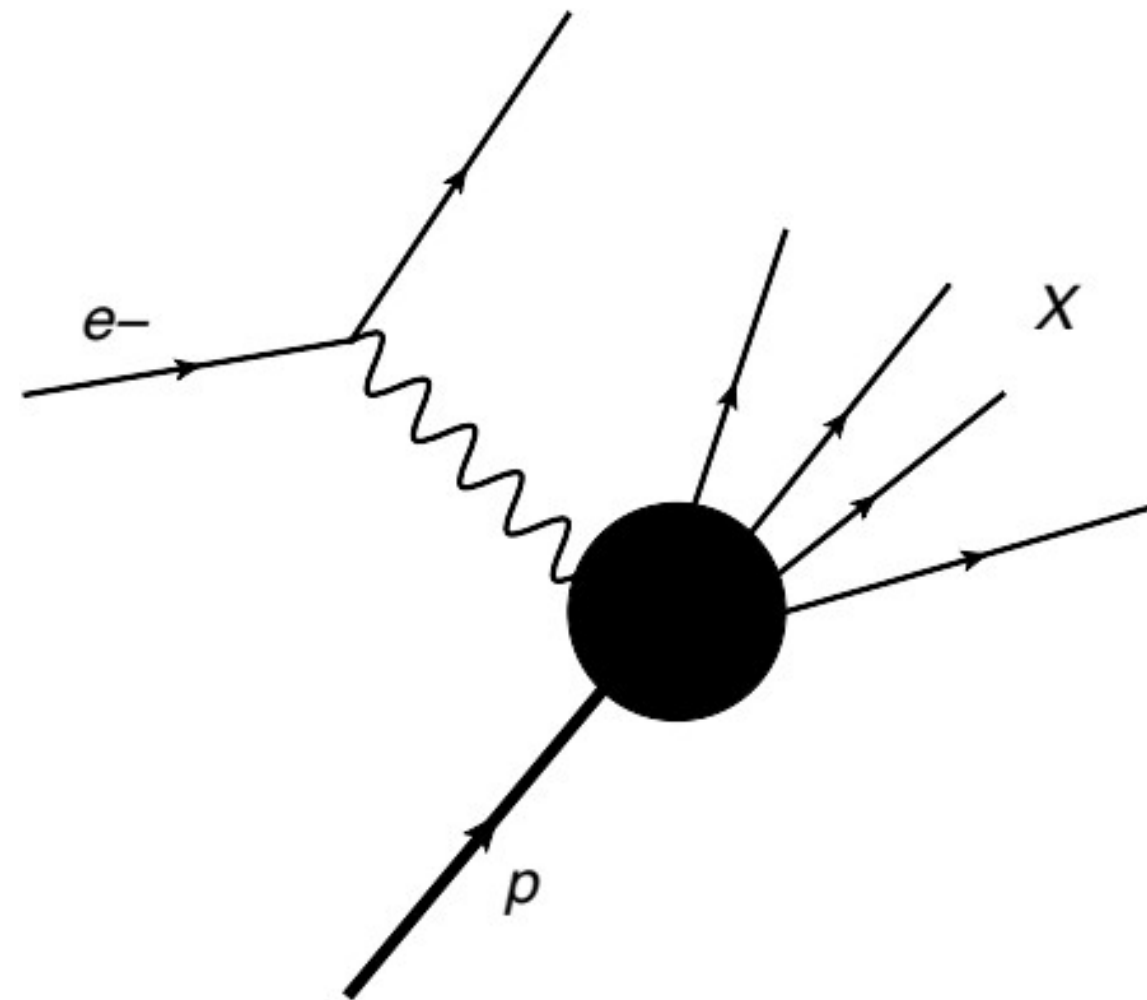
It also rose questions about the complementary and completion that may be obtained at the EIC.

**How can we make a case for an exotic program at the EIC?**

# Today's focus: heavy exotic production mechanisms

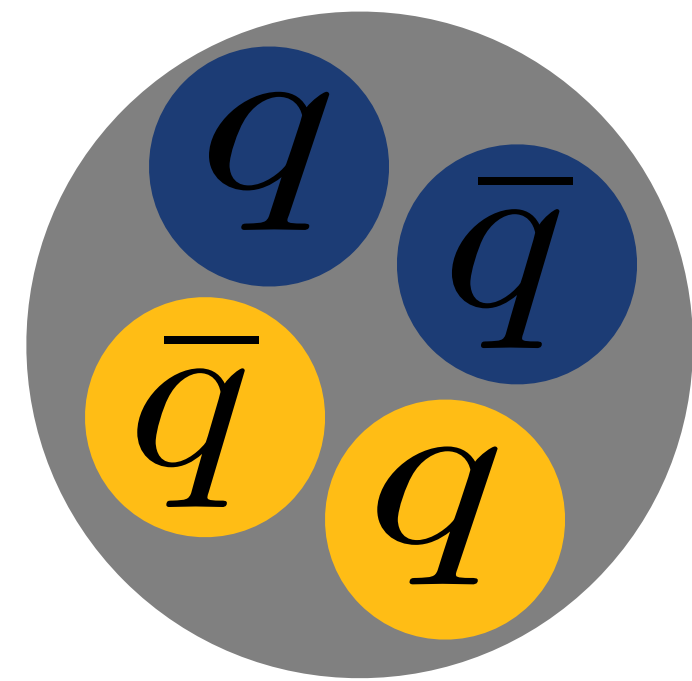
Due to the nature of the production of most of the exotic hadrons to day,  
many of them could be signals arising due to the  
**kinematic final-state rescattering effects** (triangle singularities).

With **electron beams** the EIC could resolve this matter:  
similarly to CEBAF, but with accelerated protons instead of target at rest.

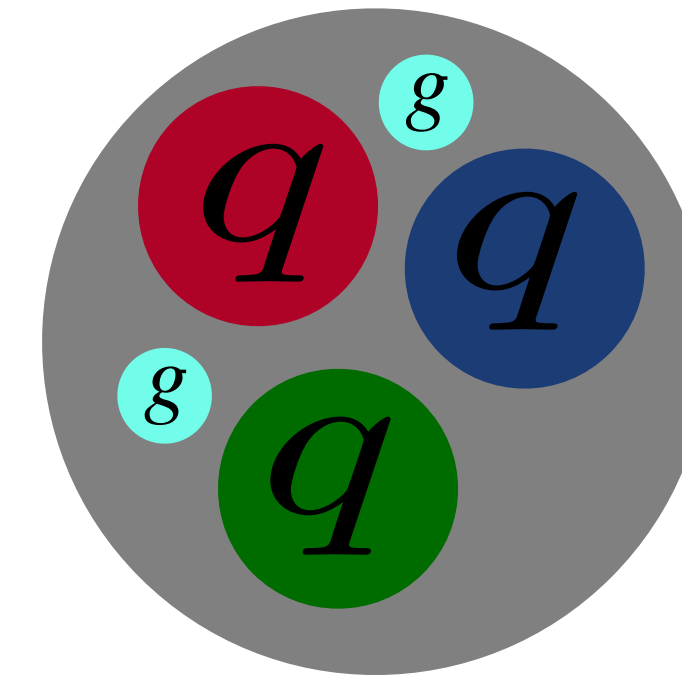
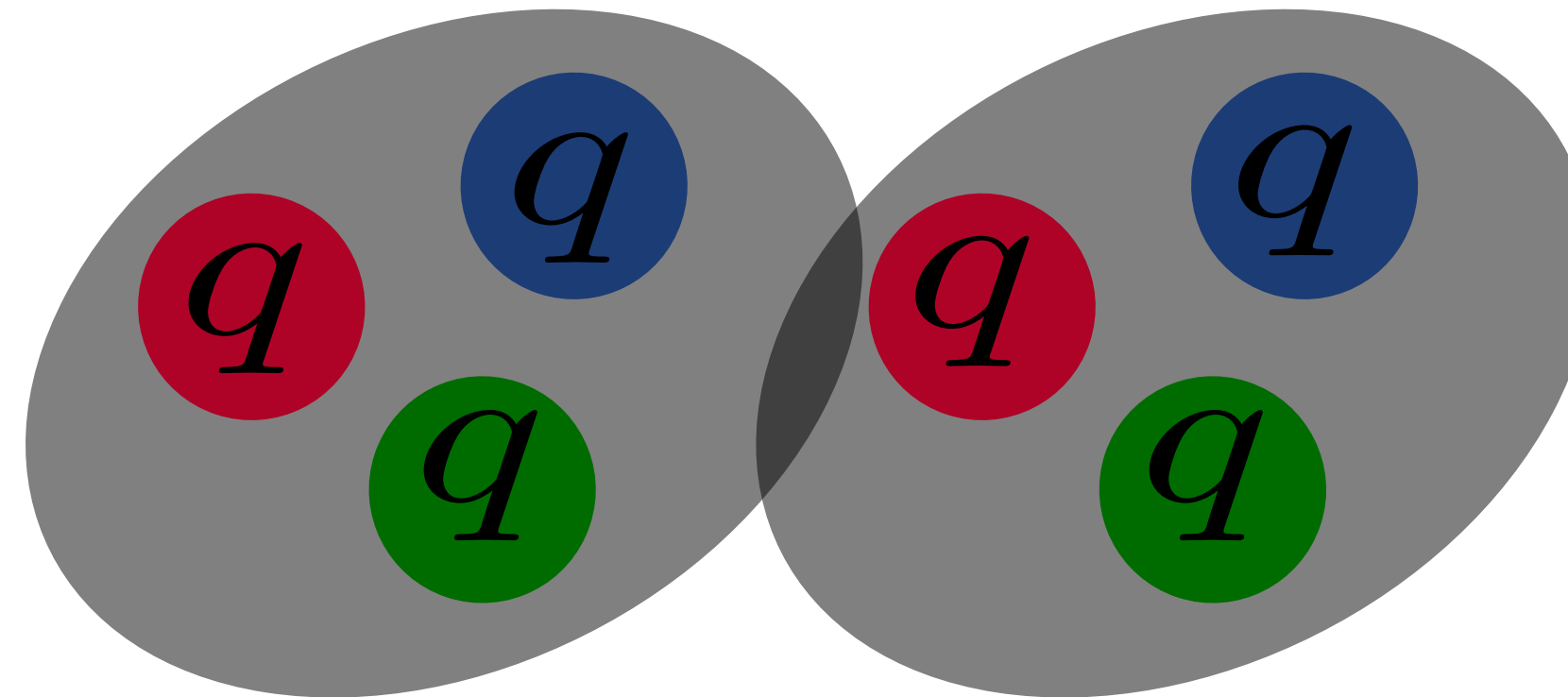
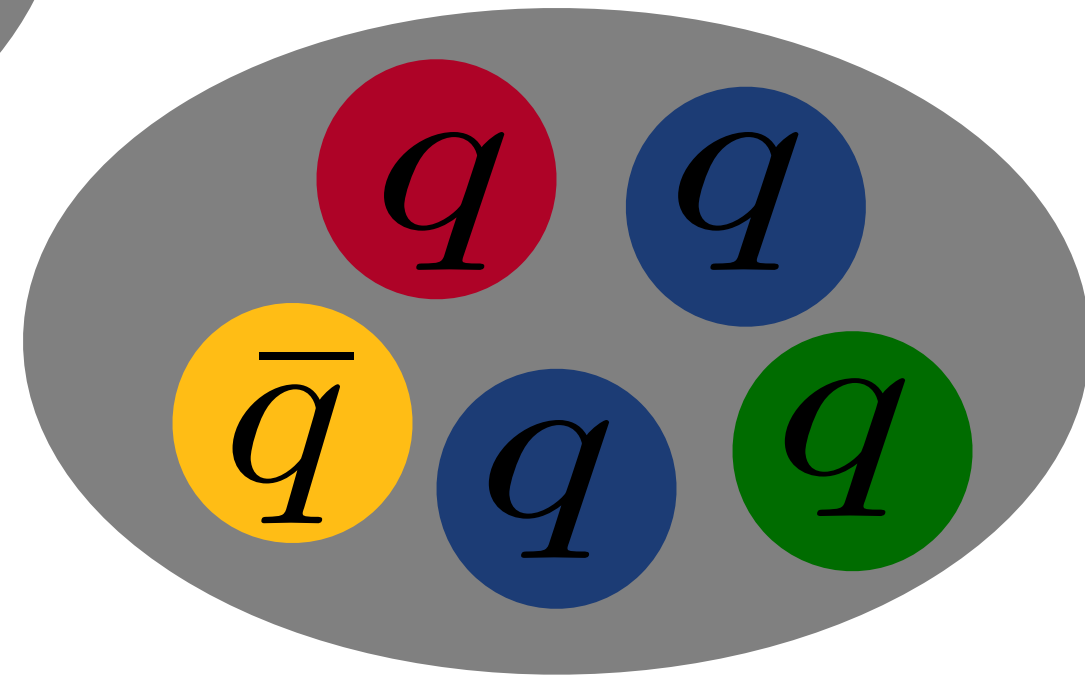
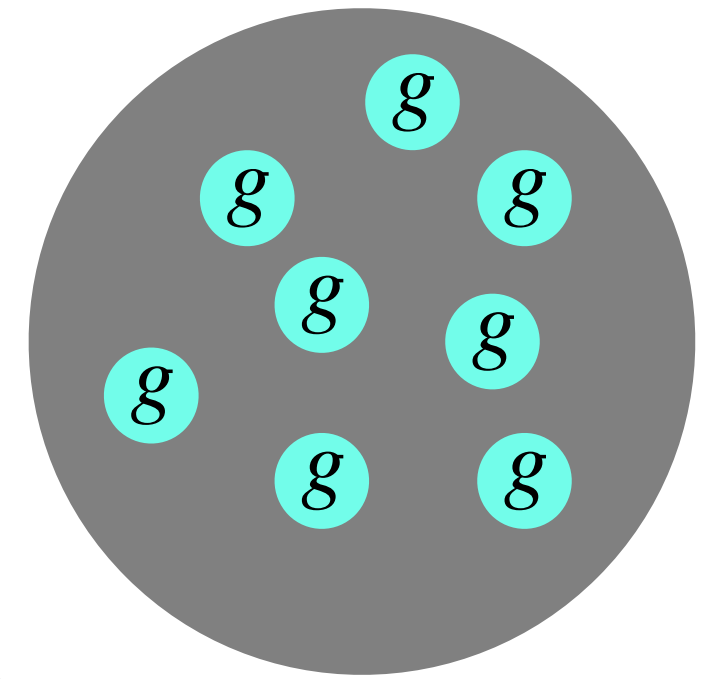


**Semi-inclusive production of mesons and hadronic molecules:** rate estimates for future experiments –  
see talks of D. Winney and F.-K. Guo.

# Other open questions



Are the signals of compact bound states, molecular states, hybrids, glueballs, ...?



Different production mechanisms and amplitude analysis can shed light onto these questions.

**Double-Regge phenomenology:** exotic searches in two-meson production – see talk of V. Mathieu.

**Amplitude analysis of LHCb pentaquarks:** microscopic structure – J. Silva-Castro.

**X(3872) and di- $J/\psi$ :** proton-proton/electron-positron production, and exploration of ultraperipheral collisions – see talks of W. Schäfer and E. Braaten.

# Possible discussion points

Universality: independence of production mechanisms and channels.

Unique benefits of exploration with the EIC setup.

Complementarity of information from EIC data.

What can be and what do we want to explore with the EIC?

Theory, experiment, simulation: what is still needed to achieve this?