

## Example Code of Beamer

Your Name

Jan 5, 2019

1 Introduction

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# Introduction

## Block Title 1

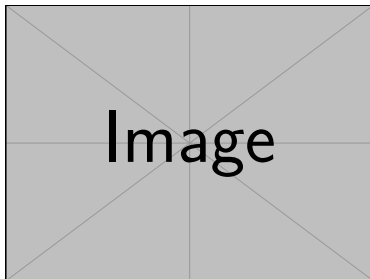
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## Block Title 2

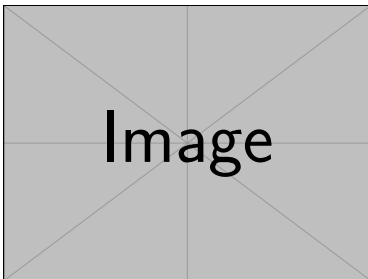
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## Example of subfigure

Idea A  $\longleftrightarrow$  Idea B



(a) Image Caption



(b) Image Caption

Figure 1: This is a caption

# Black hole

## The metric and the electromagnetic field of the spherically symmetric solution

$$ds^2 = -f dt^2 + \frac{dr^2}{f} + r^2 d\Omega_2^2, \quad (1)$$

$$F = E dt \wedge dr, \quad E = \frac{Q}{\sqrt{r^4 + Q^2/b^2}}. \quad (2)$$

where

$$\begin{aligned} f &= 1 - \frac{2M}{r} + \frac{r^2}{l^2} + \frac{2b^2}{r} \int_r^\infty \left( \sqrt{r^4 + \frac{Q^2}{b^2}} - r^2 \right) dr \\ &= 1 - \frac{2M}{r} + \frac{r^2}{l^2} + \frac{2b^2 r^2}{3} \left( 1 - \sqrt{1 + \frac{Q^2}{b^2 r^4}} \right) \\ &\quad + \frac{4Q^2}{3r^2} {}_2F_1 \left( \frac{1}{4}, \frac{1}{2}; \frac{5}{4}; -\frac{Q^2}{b^2 r^4} \right), \end{aligned}$$

and  ${}_2F_1$  is the hypergeometry function,  $M$  and  $Q$  stand for black hole mass and charge.  $d\Omega$  is the unit sphere on  $S^2$ .

# Content

## Mass $M$

$$f(r_h) = 0 \implies M = \frac{T}{v} - \frac{1 - \sqrt{\frac{16}{v^4} + 1}}{4\pi} - \frac{1}{2\pi v^2} \quad (3)$$

## Hawking temperature $T$

$$T = f'(r_+)/4\pi = \frac{1}{4\pi r_+} \left[ 1 + \frac{3r_+^2}{l^2} + 2b^2 r_+^2 \left( 1 - \sqrt{1 + \frac{Q^2}{b^2 r_+^4}} \right) \right] \quad (4)$$

## Electric potential $\Phi$

$$\Phi = \int_{r_+}^{\infty} E dr = \frac{Q}{r_+} {}_2F_1 \left( \frac{1}{4}, \frac{1}{2}; \frac{5}{4}; -\frac{Q^2}{b^2 r_+^4} \right). \quad (5)$$

The corresponding entropy is  $S = \pi r_+^2$ , The specific volume  $v = 2r_+ l_P^2$  and corresponding pressure  $P = -\frac{\Lambda}{8\pi} = \frac{3}{8\pi l^2}$

# Conclusion

## Conclusion 1

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## Conclusion 2

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# Thank You!