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New Meeting ▾



Join



Schedule



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10:42

Wednesday, March 25



**Warsztaty z Zooma...**



Start

15:00 - 16:30

Meeting ID: 720-927-220



Upcoming

Recorded



**508-361-1380**

My Personal Meeting ID (PMI)

Today

**Warsztaty z Zooma - MNik**

15:00 - 16:30

Meeting ID: 720-927-220

Wed, Apr 01, 2020

**Astronomy and Cosmology - Lecture**

10:00 - 12:00

Meeting ID: 195-135-848

# Astronomy and Cosmology - Lecture

10:00 - 12:00

Meeting ID: 195-135-848

Start

Copy Invitation

Edit

Delete

Join from a Room

[Show Meeting Invitation](#)



New Meeting ▾



Join



Schedule



Share Screen ▾

10:42

Wednesday, March 25



Warsztaty z Zooma...



Start

15:00 - 16:30

Meeting ID: 720-927-220

# Edit Meeting

## Topic

Astronomy and Cosmology - Lecture

## Date

1/ 4/2020

10:00

to

1/ 4/2020

12:00

Recurring meeting

Time Zone: Warsaw

## Meeting ID

Generated ID 195-135-848

Personal Meeting ID 508-361-1380

## Password

Require meeting password

012113

## Video

Host  On  Off

Participants  On  Off

## Audio

Telephone  Computer Audio  Telephone and Computer Audio

Dial in from [Edit](#)

## Calendar

iCal

Google Calendar

Other Calendars

Advanced Options

Cancel

Save





New Meeting ▾



Join



Schedule



Share Screen ▾

10:44  
Wednesday, March 25

**Warsztaty z Zooma...** ... Start

15:00 - 16:30

Meeting ID: 72

- Copy Invitation
- Edit
- Delete
- Join from a Room



End Meeting





Mute Stop Video Invite Manage Participants Share Screen Chat Record Reactions End Meeting

Chat

To: Everyone

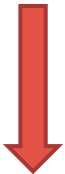
Type message

File ...

Save Chat

Participant Can Chat With:


- No one
- Host only
- Everyone publicly
- ✓ Everyone publicly and privately
















Participants (1)


 Marek Nikolajuk (Host, me)  

Mute  Stop Video  Invite  Manage Participants  1 Share Screen  Chat  Record  Reactions  End Meeting

Zoom



Mute All Unmute All More 

- Mute Participants on Entry
- ✓ Allow Participants to Unmute Themselves
- Play Enter/Exit Chime
- ✓ Allow Participants to Rename Themselves
- Lock Meeting 
- Lower All Hands

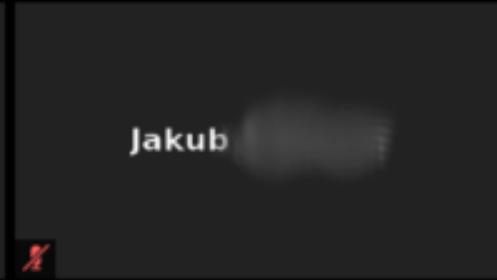




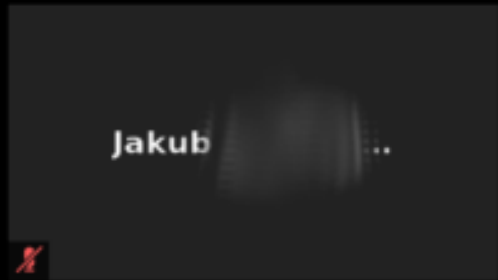
Krzysztof Gawryluk



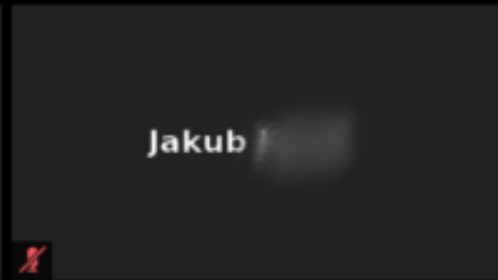
Sewern



Jakub



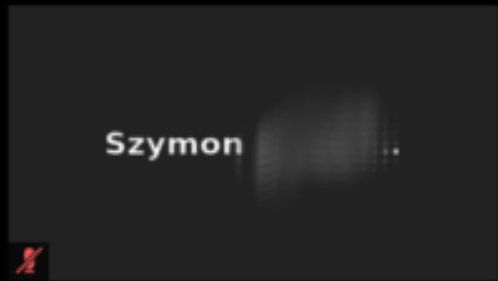
Jakub



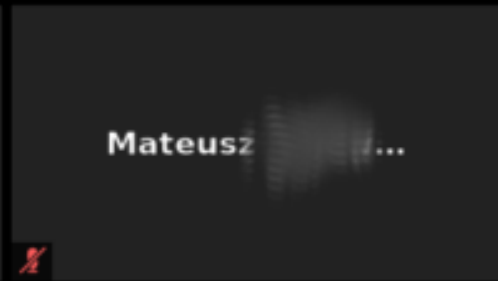
Jakub



Ewelina



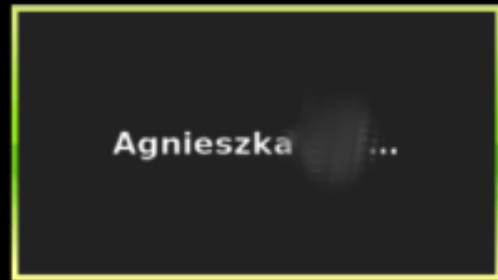
Szymon



Mateusz



Maciej



Agnieszka

**Participants (10)**

Find a participant

- EP Ewelina
- JC Jakub
- JD Jakub
- JK Jakub
- MJ Maciej
- MS Mateusz
- SS Sewern

Mute All Unmute All More

**Zoom Group Chat**

From Maciej to Everyone: 03:06  
nie mam mikrofonu  
ja to za chwilę naprawię

From Maciej to Me: (Privately) 03:10  
float sensorValue = 0; void setup() { pinMode(A0, INPUT); pinMode(12, OUTPUT); Serial.begin(9600); } void loop() { sensorValue = analogRead(A0); Serial.println(sensorValue); digitalWrite(12,HIGH); delay(sensorValue); digitalWrite(12,LOW); delay(sensorValue); }  
zrobiłem to tak, że przerwa między impulsami jest określana na podstawie ustawienia a można jeszcze raz treść?

To: Maciej Jurgiel... (Privately)



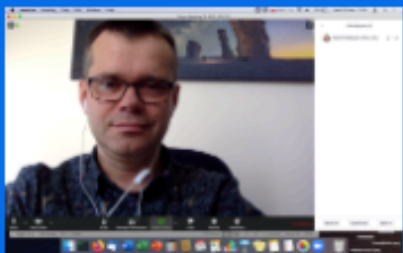
End Meeting



Basic

Advanced

Files



Desktop 1



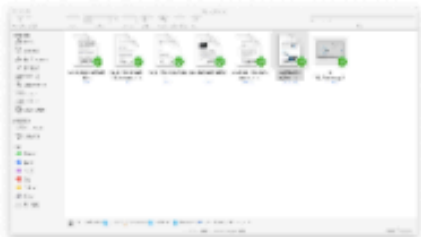
Whiteboard



iPhone/iPad via AirPlay



iPhone/iPad via Cable



Finder - Lessons



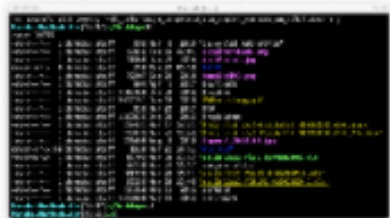
Microsoft Word - 3.Astrono...



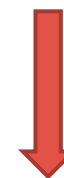
Microsoft PowerPoint - Fig-...



Firefox - Google



iTerm - Default (bash)



Share computer sound

Optimize Screen Share for Video Clip

Share

enough for Newtonian physics to apply, then we have

$$M = \frac{v^2 r}{G} = \frac{4\pi^2 r^3}{GP_{\text{orb}}^2} = \frac{v^3 P_{\text{orb}}}{2\pi G}, \quad (2)$$

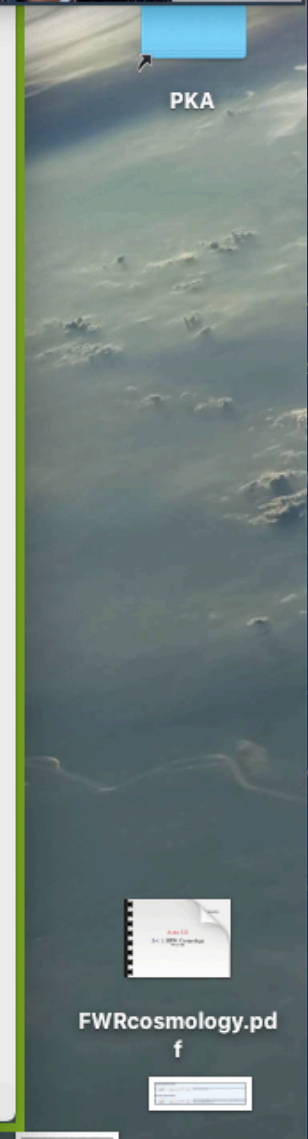
where  $r$  and  $P_{\text{orb}}$  are the radius and period of the orbit and  $v$  is the velocity of the particle. By measuring any two of  $v$ ,  $r$  and  $P_{\text{orb}}$ , we may estimate  $M$ . Equation (2) is modified in a straightforward way when the orbit is non-circular. For instance, the relation  $M = 4\pi^2 r^3 / GP_{\text{orb}}^2$  continues to be valid, provided  $r$  is taken to be the semi-major axis of the elliptical orbit of the test particle.

### 3.1. X-ray Binaries

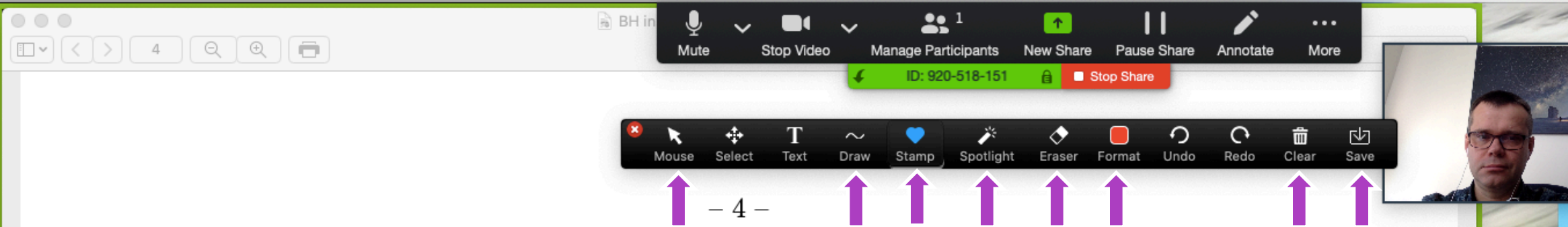
In the case of a BH XRB, it is relatively easy to measure the period  $P_{\text{orb}}$  of the orbit and the maximum line-of-sight Doppler velocity  $K_c = v \sin i$  of the companion star to the BH, where  $i$  is the inclination angle of the binary orbit. From these, one can calculate the “mass function”  $f(M)$ :

$$f(M) \equiv \frac{K_c^3 P_{\text{orb}}}{2\pi G} = \frac{M \sin^3 i}{(1 + M_c/M)^2}, \quad (3)$$

where  $M$  is the mass of the BH candidate and  $M_c$  is the mass of the companion star. Comparing equation (3) with equation (2) we see two differences. First, because we measure only the line-of-sight component of the orbital velocity, the mass function differs from the







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Marek Nikol...

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$$f(M) = \frac{K_c^3 P_{\text{orb}}}{2\pi G} = M \sin^3 i \quad (3)$$

- 4 -

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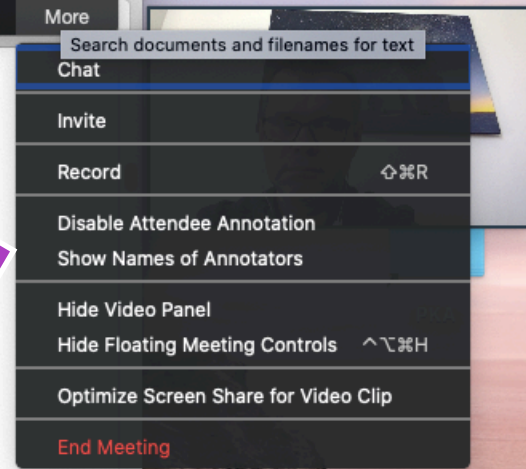
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A Zoom meeting control menu is open on the right side of the screen. It contains the following options: Search documents and filenames for text, Chat, Invite, Record (with a keyboard shortcut icon), Disable Attendee Annotation, Show Names of Annotators, Hide Video Panel, Hide Floating Meeting Controls (with a keyboard shortcut icon), Optimize Screen Share for Video Clip, and End Meeting (in red text). A purple arrow points from the right towards the 'Show Names of Annotators' option.



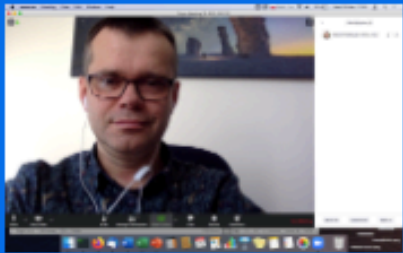
The MacOS dock is visible at the bottom of the screen, containing icons for various applications including Safari, Mail, Firefox, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Calendar, Photos, Zoom, and a trash can. The system status bar at the top shows the date and time as 'Wed 25 Mar 11:42'.



Basic

Advanced

Files



Desktop 1



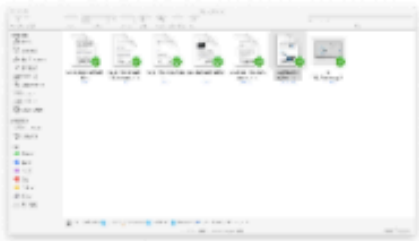
Whiteboard



iPhone/iPad via AirPlay



iPhone/iPad via Cable



Finder - Lessons



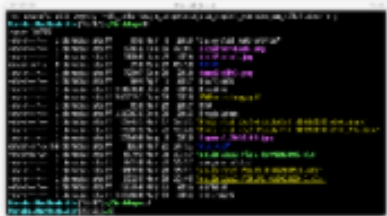
Microsoft Word - 3.Astrono...



Microsoft PowerPoint - Fig-...



Firefox - Google



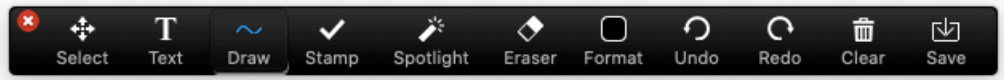
iTerm - Default (bash)

Share computer sound

Optimize Screen Share for Video Clip

Share

$$\int x^2 a$$







Mute Stop Video Invite Manage Participants Share Screen Chat Record Reactions End Meeting