

UMkhathilibe Ephaketheni Lami

UMkhathilib'Osithekile



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Ekusanguluki Kwezomkhathi

Emandulo, ulwazi ngoMkhathilibe lalukhawulwe ilokho okwakubonwa ngamehlo kuphela. Izinganekwane zazisetshenziswa ukuqinisa imibono thizeni ngoMkhathilibe.

Ekuqaleni kwa-1600, iziPopolo zokuqala zavulela iziMfundindalo ukuthi zihlonge izinto ezibuhlalazi ukwedlula lezo ezibuhlalazi noma zibukwa ngamehlo. Amakhulu ezinkanyezi ezakhuphululwa kanye nemiQongo eyahlongwa.

Ekupheleni kwa-1800, izithombe zomkhathi zavulela inhlolo yezomkhathi ngokujulile. Umuntu wayengalandela iNkanyezi ngeziPopolo aphinde futhi agcine ukukhanya kwayo kwidiski. Ngalendlela babekwazi ukuhlonga iminingilizo yemiHlaba kanye nemiQongo.

IsiThombe sesiShomo isiLimela esithwetshulwe u-Wally Pacholka, esikwazi ukubonakala ngamehlo. Kwabendabuko base Austrailia isiLimela, siyiqembu lamaKhangaru ajarhwa iqoqo lamaDingo.



uGalileo Galilei echazela iMantshu enkulu yase Venice ukuthi uzisebenzisa kanjani iziPopolo (Fresco ngu Giuseppe Bertini).



Umdwebo kaGalileo okhombisa isiLimela ngendlela esibonakala ngayo kwiziPopolo. Amasterikhi amancane amele iziNkanyezi ezifiphele.



IsiThombe sokuqala ngqa samafu aluthuli i-Orion esathwetshulwa u-Henry Draper ngo-1880 eyichaye u-50 min, esebenzisa izipopolo ezingu-28 cm ububanzi.



Ukuqala kweNhlolokukhanya

Ngonyaka we-1665, u-Isaac Newton, lowo owakhuphulula imithetho yomNyondo, wakhombisa ukuthi ukukhanya okuphuma eLangeni kwakwenziwe imibala ehlukile.

kwathatha iminyaka ukuthi iziMfundindalo zencike kulolulwazi ukuze zifunde ukukhanya okukhafulwa izinto eziseMkhathini.

Ibhudlukokukhanya okuyigama u-Newton alinikeza ukuKhanya okunhlalunhlaluziswe iPrizimu, liqukethe ulwazi ngokwakhiwa, ukushisa, kanye nesiluthi saloyonto ekhafula lokho kukhanya.

Ibudlukokukhanya lokuqala-ngqa latholokala emva kweminyaka eyam-200 kwemikhuphululo ka-Newton.

U-Newton wenza imbobo ekhethinini ukuze aqondise imisebe yelanga kwiPrizimu.

woqondisa ukukhanya kwelanga kwiPrizimu okwakhiqiza imibala yoThingo lwenkosazana. Ngokubeka iPrizimu yesibili phakathi kweshidii kanye nePrizimu yokuqala, wadlala ngeNgoni ukuze akhiqize umubala omhlophe welanga.

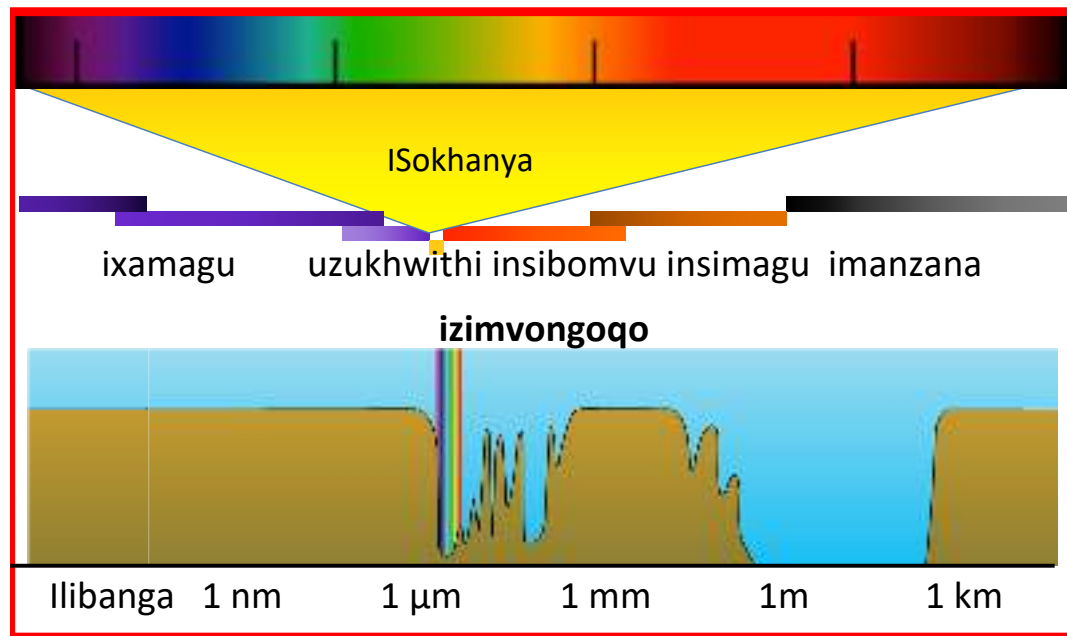
umungcwini wokuqala womQongo, wenziwa u-Huggins ngo-1860.

wawukhombisa imigqa emithathu egqhamile.

Umungcwini womunye 'umQongo'

owathwetshulwa u-Edwin Hubble ngabo-1920. Ukhombisa imigqa'ensundu ebekwe phezu kwengemuva eligqamile, elibukeka samungcwini weziNkanyezi. okush'ukuthi 'lamafu aluthuli' akusiwo amafu kepha izinkanyezi. lokhu sikubiza ngo 'Mthalakazi'

UMungcwi



Ilibanga lokukhanya lisukela ngaphansi kwa- $1/10000000000$ m kwiXamagu kuya ngaphezulu kwa-1 km kwiManzana. UMungcwi obonakalayo usukela ku 0.4 uya ku 0.8 μm , okuyingxenye encane yoMungcwi ophelele.

IziThombe zasemKhathini zifakelwa imibala yokunanezela, okuye kukhombise ingxenye yoMungcwi ongabonakali kulezoziThombe.

Umoya uvongokekile kwizingxenye ezithile zoMungcwi. ukuze izimfunfindalo zibone uMungcwi ongabonakali, okhahulwa izinto ezisemkhathini zisebenzisa iziPopolo zomkhathi noma lezo ezizungeza umHlaba.

Ukukhanya okungabonakali

Isokhanya, limele ingxenye encane yoMungcwi.

Ukukhanya kungachazeka kalula ngelibanga lalo. kusukela kwelifishane kuya kwelide, ukukhanya kwenziwe

- Imanzana (lawo anqakwa uMabonakude kanye nemiSakazo, nomaKhala ekhukhwini),
- Insimagu (njengalawa esifudumeza ngawo ukudla emakhaya),
- Insibomvu (akhahulwa izinto ezifudumele, ibonakala ngezibuko ezibalulekile),
- isokhanya (ilanga, amalambu)
- uzukhwithi (isokhanya eliphuma elangeni elidala insunduko kanye nolovuka)
- Ixamagu (ukubona amathambo).

Into enamazinga aphezulu okushisa, ikhahula uMungcwi onelibanga elifushane.

Izithombe kuMungcwi Ongabonakali

Ubukomkhathi kumungcwi ongabonakali ofana neManzana, iNsimagu, iNsibombvu uZukwithi, iXamagu, noma iMisebentathu, ivumela oSosayensi ukuthi bazi kabanzi ngendalo yezinto ezisemkhathini.

Isampula, uHoyana lothunqathunqa lufudumezwa iziNkanyezi lufinyelele emazingeni angaphansi kwawomzimba womuntu. Izinto ezicabazeke kangaka zikhafula kwiNsibomvu, kanti iziNkanyezi ezinamazinga okushisa aphakathi kwa-3 000 kuya kuma-50 000 zikhafula kwiNsokhanya. Kolony'uhlangothi, uthunqathunqa oluthibeliwe lufudumezwa lifike emazingeni okushisa ayizinkulungwane noma ngaphezulu. Lugqhama kakhulu kwiXamagu.



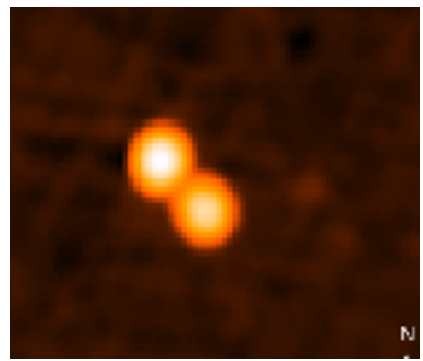
UmThalakazi i-Sombrero uyinguzungasichompe equkethe umsuka oyingqumu owakhiwe izinkanyezi ezindala, kanye nothunqathunqa. Isinxele: isithombe esithwetshulwe iziPopolo ze-ESO 1.5 m ububanzi kwiSokhanya. esokudla: isithombe sombala ongewona: isithombe esithathwe izipopolo i-spitzer kwinsibomvu (obomvu), oshishilizwe kwisithombe esithathwe izipopolo i-Hubble kwisokhanya (oluhlaza).

IsiXheke semThalakazi i-Phoenix. Isithombe semiThalakazi (oncombo) sibekwe phezu kweseXamagu esathathwa izipopolo i-Chandra, esiveza ifu elikhulu elinamazinga okushisa afinyelela kwizinkulungwane.

Imikhushulo kwingcwi engabonakali

Ezinye izinto kumKhathilibe zifihlekile, kuzekuba oSosayensi bazibuke ngezipopolo ezizaze 'kwingcwi efihlekile'. Izinto ezibandaka noma ezishisa-bhe zikhafula kwiNgcwi efihlekile kanti zakhushulwa ngeNgcwi yazo engabonakali. Kamuva, lapho oSosayensi babebuka emkhathini ngezipopolo ezinkulu eziqoqa ukukhanya okuningi futhi ezizaze, basebekwazi ukubona lezizinto kwiNgcwi ebonakalayo. kwakuyilesisimo nakwiziPhinqi, isampula, zakhushulwa kwiManzana, kanye nemiThalakazi equkethe ezikhafula kwimisebentathu, lapho khona imisebentathu yahlongwa maphambili kokukhuphulwa komThalakazi.

Isithombe seManzana esithathwe i-VLA se-3C273. Ngo-1963, uMartin Schmidt wakhombisa ukuthi phakathi nendawo kwe-3C273 kukhona insaNkanyezi elundwa, ekudana. Lesi kwakuyisiPhinqi sokuqala ukuthi sikhushulwe. Isithombe kwiSokhanya esithathwe i-Hubble sikhombisa ujikijelotho olusuka kwisiPhinqi.



Isithombe semiThalakazi emibili esithathwe i-Hubble kwiSokhanya eyakhushulwa isizungezi i-IRAS kwiNsibomvu. Ukugqhama kwayo kuphindeke ngokwe-100 kwiNsibomvu kuna kwiSokhanya, kanti zibizwa nge-ULIRGs (ImiThalakazi ensibomvu ekhafula kanje). Eminigi imiThalakazi inesingani neminye imiThalakazi





Usonteko loMnyondo i-IRG 3-757. Isangqo esilundwa isithombe esihlanakezelwe somThalakazi olundwa, ongemuva komThalakazi oyinguzung'ebomvu.

UTho kanye neMpekumpeku Engabonakali

Ezinye zezimilo zomkhathilibe zikhomba ukuthi kukhona itshe loTh'olungahlonzeki, elubizwa ngokuthi 'InJelwane', obonakala kuphela ngomNyondo wawo ophazamisa ukunyakaza kwalokho esikubonayo.

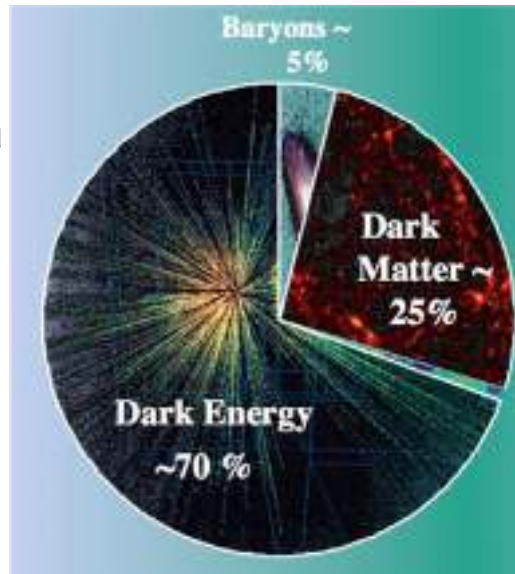
Ososayesi abavumelani ukuthi lolutho akusizo iziNkanyezi, imiHlaba emincane, amafu ansundu, iziGwinqi, noma ungoTho.

Ubuko lemiThalakazi esekudeni kukhombisa ukuthi ukulwiza komKhathilibe kuyakhawuleza. Incazelo ekuvunyelwana ngayo ukuthi kunohlobo lweMpekumpeku olungaziwa oludala lomkhawulezo, ebizwa nge 'mPekumpeku engabonakali'.

Amanye amaTiyori awadingi uTho noma impekumpeku engabonakali, kodwa kumele akwazi ukuchaza lokhu esikubonayo njengoba lawomTeyori ekuvunyelwana ngawo enza.

UmThalakazi oyinguzungu oqukethe uTho olungabonakali usebenza njengeNgilazi yokukhulisa ukukhanya okuqhamuka kumThalakazi ongemuva kwawo. ukukhweceka kwemisebe kukhweciswa umNyondo njengoba ayebhulile u-Einstein ngo-1915.

Izibalo zikhombisa ukuthi umkhathilibe wakhiwe: imPekumpeku esithekile yenza cishe u-70% womKhathilibe, 25% inJelwane, kanti umKhahilib' esiwubonayo (imiThalakazi kanye kanye nokutholakala kwinQeke) kwenza u-5%.



Imibuzo

Iziphi iziThombe ezithwetshulwe kwiSokhanya?

Izimpendulo zikwi overleaf

Isithombe somThalakazi i-M31 esithathwe ngeziPopolo zozuKhwithi ezazikwisibuki seNASA i-Swift

isiThombe esithathwe kwiManzana, esithathwe i-VLA sikhombisa isiShwila lomThalakazi omanzana i-3C353.

Isithombe somQongo i-cat eyes nebula esithwetshulwe kwiSokhanya.

Isithombe senhlanganisela samafu aluthuli atholakala kwinqeke yomkhathi esithathwe kwiNsibomvu ngeziPopolo i-Spitzer. Izishimanqa ezibomvu izindawo lapho kudaleka iziNkanyezi khona.

Isithombesenhlanganisela yeXamagu (olundwa) / yeManzana (obomvana) sesiXheke semThalakazi i-Abell 400. IziShwila zicosuka kwimpakathi kumnyombombili kumThalakazi osendeni.

UMkhathilibe Ephaketheni Lami No. 2

LeNcwajana yabhalwa ngowezi-2017
ibhalwa u-Grażyna Stasińska wase-Paris
Observatory (France) yase iningilizwa u-
Stan Kurtz wase-UNAM Radio
Astronomy Institute in Morelia (Mexico).

Ikhava: Ingxenye yeningizimu yewalakahla le-
Chandra, isithombe esiwumahlanganisela
esithathwe kwiXamagu ngeziPopolo
zomkhathi i-Chandra. Ikhombisa amakhulu
eziPhinqi asekudeni okungango-12 billion
light-years.

Izithombe eziningi kuleNcwajana zithathwe
kuziPopolo i-Hubble, i-Spitzer, kanye
neChandra, kanye nakwizipopolo zemanzana i
VLA (Very Large Array radio).



Uma ufisa ukufunda kabanzi
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kuleNcwajana, sicela
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