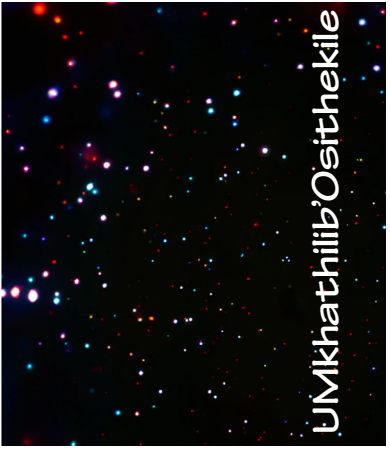


8 IziKhathe semThalalakazi-Phoenix, leithornbe semThalalakazi (omcombo) sibekwe phezu kweeXarnagu esatshathwa izipopolo i-Chandra, esiveza ihu elikhulu elinamazinga okushisa afinyelela kwizinkulungwane.

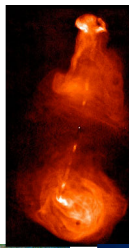
UrnThalalakazi-Gortbrero uynguzungalo chompe equkethe umusika oyingqumnu owakhiwe izinkanyezi ezindala, kanye nothungathungu. Iinkxelo: leithornbe esithwethulwe iziP opolo ze-ESO 1.5 m ubudanzi kwiSokhanya, esokudla: leithornbe soribala ongawona: leithornbe esithathwe izipopolo i-epitzer kwisibornvu (obornvu), oshielizwe kwisithornbe esithathwe izipopolo i-Hubble kwiSokhanya (oluhaza).



UMkhathilibe Ephaketheni Lami



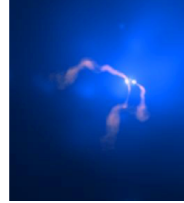
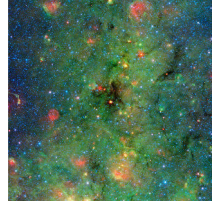
Iziphi iziThombe ezithwethulwe kwiSokhanya?



Izimpendulo zikwi overleaf



Imibuzo



Izithornbe kuMungcwi Ongabonakali

Ubukonkhathe kumungcwi ongabonakali ofana neMlanzana, iNaimagu, iNisibornvu uZukwithi, iXamagu, noma iMisebentathu, iVumela oSosayensi ukuthi bazi kabanzi ngendalo yezinto ezisemkhathini. Isempula, uHoyana lothungathungu lufudumezwa iziNkanyezi lufinyelele emazingeni angaphansi kwawomzimba womuntu. Izinto ezicabazeke kangaka zikhafula kwiNisibornvu, kanti iziNkanyezi ezihamazinga okushisa aphakathi kwa-3 000 kuya kuma-50 000 zikhafula kwiNisobhanya. Kolony'uhlangothi, uThungathungu oluthibelwe lufudumezwa ilfike emazingeni okushisa ayizinkulungwane noma ngaphezulu. Luqghama kakhulu kwiXamagu.

UTho kanye neMpekumpeku Engabonakali

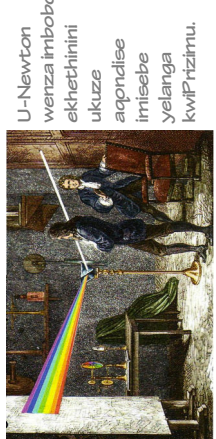
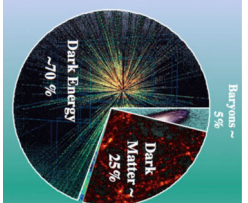
Ezirye zezimilo zomkhathilibe zikhomba ukuthi kukhona itshelo Tholungahlonzeki, elubizwa ngokuthi 'iJelwane', obonakala kuphela ngomNyondo wawo ophazamisisa ukunyakaza kwalokho esikubonayo. Osoosayensi abavumelani ukuthi lolutho akusizo iziNkanyezi, imiHlabha emincane, amafu anesundu, iziGwirqi, noma urngo Tho. Ubuko lerniThalakazi esekudeni kukhombisa ukuthi ukulwiza komKhatilibe kuyakhawuleza. Incazelo ekuvuyelwana ngayo ukuthi kunohlobo lweMpekumpeku olungaziwa oludala lomkhawulezo, ebizwa nge 'mPekumpeku engabonakali'. Amanye amaTyori awadingi uTho noma impekumpeku engabonakali, kodwa kumele akwazi ukuchaza lokhu esikubonayo njengoba lawomTeyori ekuvuyelwana ngawo enza.



Useteko lokhNyondo HEG-3-757, isanqop esilundwa leithornbe esihlanakezeliwe semThalalakazi olundwa, ongemuva komThalalakazi oyinguzungu ebornvu.

UrnThalakazi oyinguzungu oqukethe uTho olungabonakali usebertza njengenGijlazi yokukhulisa ukukhanya okuqhamka kunThalalakazi ongemuva kwawo, ukudhwebeka kwemisebe kukhwebeswa umNyondo njengoba ayeluhlile u-Einstein ngo-1915.

Izibalo zikhombisa ukuthi umkhathilibe wakhiwe: iMP ekumpeku esithekile yenza cishe u-70% womkhathilibe, 25% iNjelwane, kanti umKhatilibe esiwubonayo (imThalakazi kanye kanye nokutholokala kwiNqoke) kwenza u-



U-Newton wenza imbobo ekhethinini ukuze agondise imisebe yelanga kwiPrizimu, woqondisa ukukhanya kwelanga kwiPrizimu okwakhqiza imibala yoThing lwentkosazana. Ngokubeka iPrizimu yesibili phakathi kweshidi kanye nePrizimu yokuqala, wadlala ngeNgori ukuze akhqiize umubala omhlophe welanga.

umungcwi wokuqala womGongo, wenziswa u-Huggins ngo-1860.

wawukhombisa imigga emithathu eqqhamile.

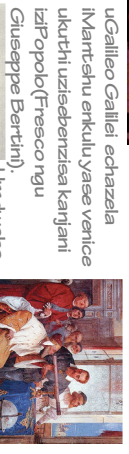
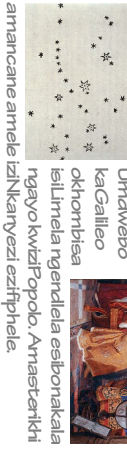
Urnungcwi womunye 'umGongo' owathwethulwa u-Edwin Hubble ngabo-1920.

Ukhombisa imigga ensundu ebekwe phezu kwengemuva eligqamile, elibukeka samungcwi weziNkanyezi okushukuthi lamafu aluthuli' akusiwu amafu kepha izinkanyezi. lokhu sikubiza ngo 'Mthalakazi'

Ukuqala kweNholokukhanya

Ngonyaka we-1665, u-Isaac Newton, lowo owakhuphulula imithetho yomNyondo, wakhombisa ukuthi ukukhanya okuphuma elangeni kwakwenziwe imibala ehlukile. kwathatha iminyaka ukuthi iziMfundindalo zencike kuloluwazi ukuze zifunde ukukhanya okukhafuwa izinto eziseMkhathini. Ibhudlulukokhanya okuyigama u-Newton alinikeza ukukhanya okunhlaluhlaluziswe iPrizimu, liqukethe ulwazi ngokwakhiwa, ukushisa, kanye nesiluthi saloyonto ekhafuwa lokho kukhanya. Ibhudlulukokhanya lokugala-ngqalatholokala enva kweminyaka eyam-200 kwemikhuphululo ka-Newton.

uGalileo Galilei echazala iMantehu enkulu yase Venice ukuthi uzibenzisa kaqinani iziPopolo (Fresco ngu Giuseppe Bertini).
Umdlwebho kaGalileo okhombisa isilimela ngendlela esebonakala ngayo kwiPopolo. Amasatarkhi amancane amele iziKanyezzi ezifiphele.



IstThombe seesiShorno isilimela esithwetshulwe u-Wally Patcholka, esikwazi ukubonakala ngamheho. Kwabandabuko base Australia isilimela, siyqembu lamakhangano ajahywa iqoqo lamalDingo.

IstThombe esithathwe kwiManzana, esithathwe i-VLA sikhombisa isisShwila lomThalakazi omhanzana i-3C355.

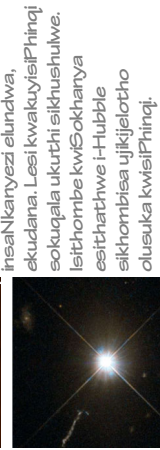


IstThombe somThalakazi i-M3 1 esithathwe ngeziPopolo zozikhwathi ezaziKwisiBuki seNASA i-Swift.

IstThombe somGongo i-cat eyes nebula esithwetshulwe kwiSokhanya.

IstThombe esihlanganisa isarnaru aluthuli atholakala kwinqoke yomkhathi esithathwe kwiNeibomvu ngeziPopolo i-Spitzer. Izisihmanga ezibomvu izindawo lapho kudaleka iziKanyezzi khona.

IstThombe seManzana esithathwe i-VLA se-3C273. Ngo-1963, uMarthin Schmidt wakhombisa ukuthi phakathi nendawo kwe-3C273 kukhona ineaNkanyezzi elundwa, esokuqala ukuthi sikhushulwe. IstThombe kwiSokhanya esithathwe i-Hubble sikhombisa uKujjelotsho oluauka kwisiPhinji.



IstThombe semiThalakazi embili esithathwe i-Hubble kwiSokhanya eyakhushulwa isizungazi i-IRAS kwiNeibomvu. Ukugqinama kwayo kuphindeke ngokwe-100 kwiNeibomvu kuna kwiSokhanya, kanti zibizwa nge-ULIRGs (ImiThalakazi enisibomvu ekhafula kanje). Eminingi imiThalakazi inesingani neminye imiThalakazi

IstThombesenhlanganisela yeXamagu (olundwa) / yeManzana (obomvana) seesiXhoke semiThalakazi i-Abell 400. IzisShwila zicoosuka kwimpekathu kumnyombombili kumThalakazi osendeni.



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

Ikhava: Ingxenye yemingqizimu yevalakakala le-Chandra, isthombe esihlanganisa senlanjanisela esithathwe kwiXamagu ngeziPopolo zomkhathi i-Chandra. Ikhombisa amakhulu eziPhinji asekudeni okungango-1.2 billion light-years.

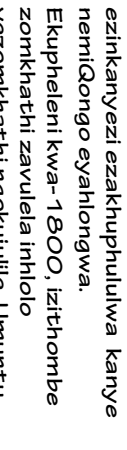
LeNcwajana yabhalwa ngowezi-2017 ibhalwa u-Grazyna Stasińska wase-Paris Observatory (France) yase ihingilizwa u-Stan Kurtz wase-UNAM Radio Astronomy Institute in Morelia (Mexico).

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

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

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

Uma ufeza ukufunda kabanzi ngaloluhungechunge kraye nezihloko ezethulwe kuleNcwajana, sicela uvakashele u-<http://www.tuimp.co.za>



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