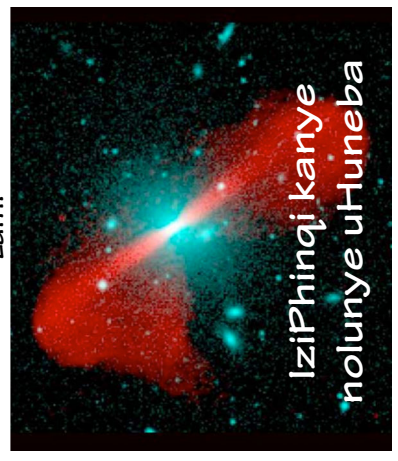




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### UMkhathilibe Ephaketheni Lami

Ukuzama ukuthola iziPhinqi ezikude kuwumsebenzi obalulekile futhi onzima. Lesi isiThombe sakhiwe ngesangulo esithathwe gezipopolo isioan Digital Sky Survey kanye ne- UKIRT Infrared Deep Sky Survey.

Savumela ukuphakanyiswa kwesiPhinqi esikude kunazo zonke ezaziwayo. IziPhinqi i-ULAS J1 120+064-1 (elichazwa elibovu elincalala elikhonjwe iningq embili emhlophe). Umubala kuphela ohlukanisa phakathi kwesiPhinqi kanye nezinye izikhafu kukhanya, iningq izazo okuyiziNkanyezi kumThalakazi weThu. **8**

### EsiNgakuqondisisi

Kusa nemibuzo eminingi ngeziPhinqi edinga izimpendulo. Mhlawumbe umubuzo obaluleke kakhulu ukuthi ngabe zadaleka kanjani iziPhinqi ezinkulu kakhulu.

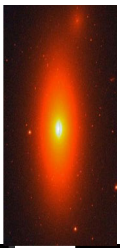
IziPhinqi zibaneka kakhulu ngalendlela yokuthi zikwazi ukuhlongeka zikude kakhulu kanti futhi ukhanya okusuka kuzona kuthatha isikhathi eside ukuthi kufike kuthina. Ukukhanya esikuthola kuqhamuka kwesikude kakhulu, i-ULAS J1 120+064-1, kwakhafuwa eminyakeni eziyizi ezama-500 emva kokudaleka komkhathilibe.

Kunezigamako ezimubalwa ezizama ukuchaza ukuthi isiGwinqa esinesisindo esiphindeke izigidi ezimbili kweselanga sasengadaleka kanjani ngokushesha emva kokudaleka komkhathilibe. **9**



Izimpendulo zikwi-overleaf

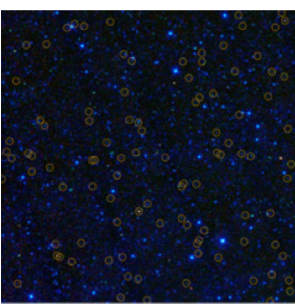
Ziyini lezi iziGumbu?



### Imibuzo

UmlThalakazi omkhulukazi olupesi INGC 4889, oqukethe isiGwinqa esikhulukazi (onesisindo esiphindeke isigidi kweselanga) kungase kube isiPhinqi.

Uhlolomkhathi kwinsibomvu selathola izigidi zezinto ekuqungazaka ukuthi zibe iziPhinqi, kulesi isiThombe lokhu okungase kube iziPhinqi kuzingelezwe ngombala ophuzi. **12**



### IziPhinqi kuMkhathilibe

IziMfundinalo zomkhathi zicabanga ukuthi yonke imiThalakazi iqukethe inguzungu yesiGwinqa. ImiThalakazi kungase kwenzeke ukuthi ishintsha phakathi 'kwesithongabusika' nezikhathi 'zobukhuphekuphe' obukhulu lapho khona isiGwinqa sigwinqa utho oludlula noma oluseduze kwaso.

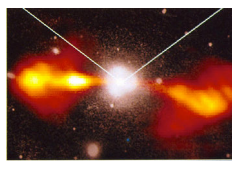
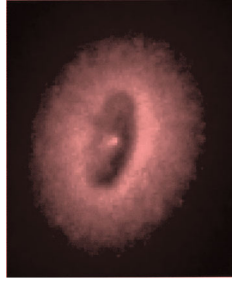
Uqukethomagama lweziPhinqi olususelwa kubomkhathi kwisokhanya luqukethe izinto cishe eziyi-300, 000. Yize sekunezigidi zalezo izinto ezilindele ukuqinisekiswa ukuthi ziyiziPhinqi kanti futhi ziningi ezizayo ezizophakanyiswa uhlolomkhathi lakusasa.

Ngoba iziPhinqi zibengezela ngokwemvelo yazo, imvange yazo ivumela ukuthi sikwazi ukuhlola utho olukude kuzo kuyofika kunqongema lomkhathilibe. **15**

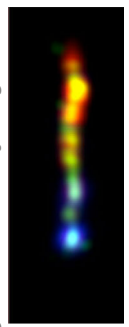
### Izicaba, iziShwila kanye neminye imumo

Ngezipopolo zeHubble, izimfundinalo zikwazi ukubona imininingilizo engabonakali ngezipopolo ezisemhlabeni. Sesikwazi ukuhlukanisa izimo zemThalakazi lapho kusuka khona iziShwila.

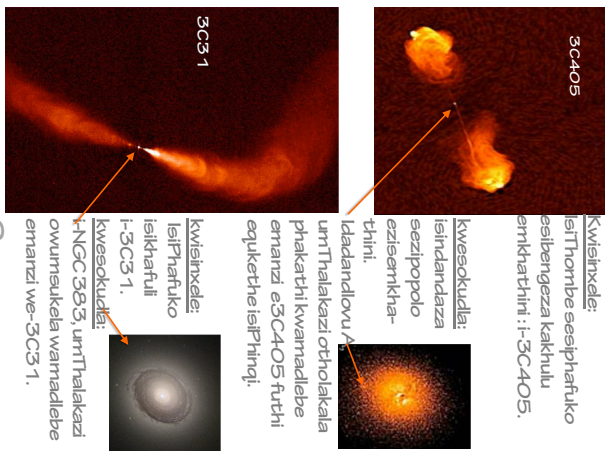
Izicaba ezinothuli zibonakala ezifubeni zalezo ezisemaduze. Kokunye, 'iziShwila' zibonakala kwisokhanya zikhomba makude kunomnyombo womThalakazi izipopolo zexamagu zikhombisa ukuthi iziPhinqi kanye nemThalakazi ezihlobene nayo ziyizixamagu eziqhakaka kakhulu. Okwamanje, izimfundinalo seziphakamise iningq lezinto ezinezimo ezifanayo ncamashi neziPhinqi kodwa ezingakhafu emagagasini emanzana. Lezi bazibiza ngeziPhinqi duli. **5**



Iklubo leNGC 4261. Kwisinxela: Amaclabe emanzi (200,000 kwikhanyabanga ubude) awolintshi umbala kanye nomThalakazi osindandaza embalweni omhlophe. Kwesokudla: isiThombe esithwetshulwe iziPopolo i-Hubble sesifuba esikhombisa izicaba sobhuli esingama-400 kwikhanyabanga ububanzi.



Iklubo lesishwila i-3C273 (izi-100,000 kwikhanyabanga ubude) kwixamagu (oluhlaza), kwisokhanya (hlaza) nakwinsibomvu (bovu) ngezipopolo zeChandra, iHubble, kanye neSpitzer. **4**

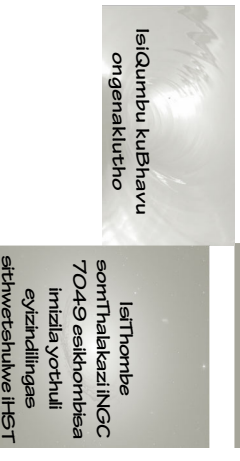


**3C405**  
 Kwisinxele:  
 Isithombe esiphafuko  
 esibengeza kakhulu  
 emthathini: i-3C405.

**3C3 1**  
 kwesokudala:  
 Isindandaza  
 sezippolo  
 ezisemkha-  
 thini.  
 Isithombe esiphafuko  
 esibengeza kakhulu  
 emthathini: i-3C405.

**3C3 1**  
 kwisinxele:  
 Isiphafuko  
 Isikhafuli  
 i-3C3 1.  
 kwesokudala:  
 i-NGC 363, umThalakazi  
 owumakela warmadlebe  
 emanzi we-3C3 1.

**Ukusebenza kweziPhinqi**  
 Ngokjwayelekile, iziPhinqi zikhafula  
 impekumpeku elinganiselwe kuleyo  
 ekhafulwa imiThalakazi eyi-1 000  
 kurruzwana, endaweni encane ukudlula  
 umThalakazi cishe isigidi ngokuphindleka.  
 kwenzeka kanjani lokhu? kuyacaca ukuthi  
 urnsuka walorronzi akusiyi INkanyezi.  
 Sekuyayumelwana manje ukuthi iziPhinqi  
 ziqukethe kumsuka wazo iziGwinqa  
 ezinkulu, ezidonea utho oluseduze  
 kwazo. Ngaphambi kokungena  
 kwisiGwinqa, utho luyashwilekela  
 kwisicaba sehlumelo, lapho khona  
 lueshiswa emazingeni aphhezulu  
 okushisa, bese lukhigiza ukukhanya  
 kuzwikhwithi kanye nakwixamagu.  
 IziGwinqa ezinkulu zikhanya kakhulu.  
 Lokhu ukukhanya kushayisana nomoya  
 ongunge iziGwinqa, bese kuqhizeka  
 umungcw obonakala kuphela kwiziPhinqi.

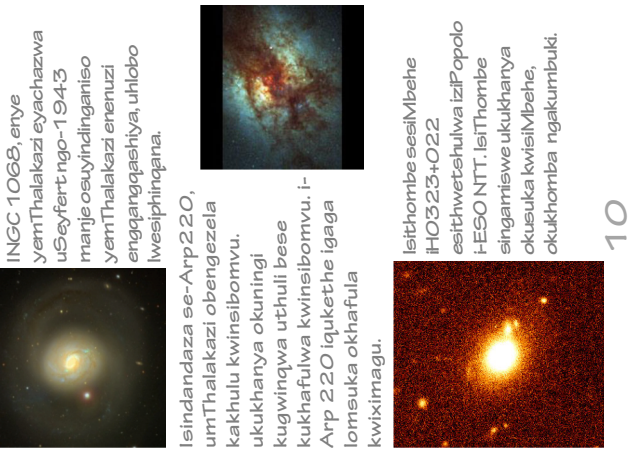


IsiGumbu kubhavu  
 ongenaklutho

Isithombe  
 somThalakazi iNGC  
 7049 esikhombisa  
 imizila yochuli  
 eyizindilingas  
 esthwebhulwe iHST

Isithombe somThalakazi  
 iNGC 1277 oqukethe  
 isigwinqa esikhulakazi  
 esthathwe kwiHST

Inkatha eluthuli  
 equkethe evuthelisa  
 isigwinqa esitholakala  
 kulinyombu  
 womThalakazi iNGC  
 4261 eyayibukwe  
 ngezippolo  
 zomkharthi iHubble



INGC 1068, enye  
 yemThalakazi eyachazwa  
 uSeyfert ngo-1943  
 manje osuyindinganiso  
 yemThalakazi enenuzi  
 engqangqashiya, uhlobo  
 lwesiphinqana.

Isindandaza se-Arp 220,  
 umThalakazi obengezela  
 kakhulu kwinsibomvu,  
 ukukhanya okuningi  
 kugwinjwa uthuli bese  
 kukhafulwa kwinsibomvu. i-  
 Arp 220 iqukethe igaga  
 lomusuka okhafula  
 kwiximagi.

Isithombe sesiMbehe  
 iHO323+022  
 esithwebhulwa iziP opolo  
 HESO NTT, Isithombe  
 elingamiswa ukukhanya  
 okusuka kwisiMbehe,  
 okukhombisa ngakumbuki.



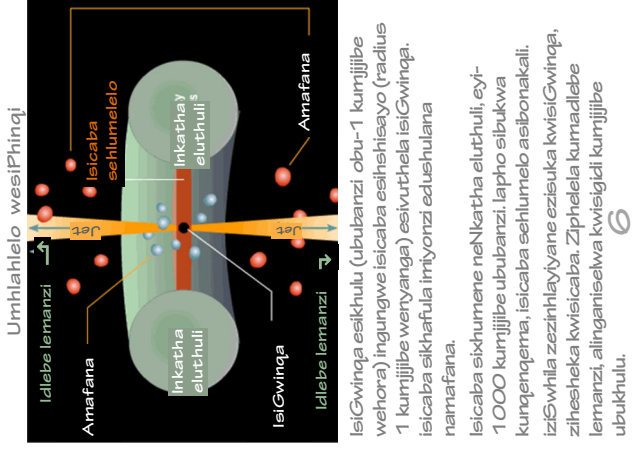
Ukufunda kabanzi ngalolu  
 uchungechungu kanye  
 nezihloko ezethulwe  
 kuleNcwajana, sicela  
 uvakashele u-  
<http://www.tuinip.org>

Inumshwari: Nkhathla Mbanbo  
 TUIMP Creative Commons

**UmKhatshilibe Ephaketheni Lami No. 6**  
 Le Ncwajana lilotshwe ngonyaka wezi-  
 2016 ilotshwa nguGrazyna Stasinska  
 waseParis Observatory (France) yase  
 iningilizwa nguStan Kurtz wase-UNAM  
 Radio Astronomy Institute in Morelia  
 (Mexico)  
 Isithombe esisekhraveni: Ikhubo lomThalakazi  
 omkhulakazi depesi iNGC 5532 (culuhlaza  
 saasiphakabhaka) kanye nezishwila zeesikhafuli-  
 3C296 (obomvu). Inap yemanzi yakhiwe  
 ngesangulo soyacala wezippolo esikhulakazi  
 iMA ezinye izithombe kule Ncwajana  
 zithathelwe kwizippolo iHST, CXO, SAO,  
 Spitzer and UKIRT.

**Olunye uHunoba**  
 Ngaphambi kokuphakanyiswa  
 kweziPhinqi, sase sivele sazi ukuthi  
 eminye imiThalakazi inemisuka  
 ebengezela kakhulu kanti futhi  
 enemivange engajwayelekile.  
 ImiThalakazi efana nalena yaqanjwa  
 ngokuthi amaSeyfert. Ayingxenywe  
 'yemiThalakazi enomuNyombo',  
 okufaka kuyo iziPhinqi kanye  
 nezimbehe.  
 Khona nje, ubuko lomkharthi  
 kwinsibomvu lwakhombisa ukuthi  
 kunenani lemiThalakazi ebengezela  
 kakhulu kwinsobomvu kodwa  
 engabonakali nhlobo kwisokukhanya.  
 Iningi la lemiThalakazi  
 kucaatshangwa ukuthi liqukethe  
 imiNyombo.

**Ukuphakanyiswa kweziPhinqi**  
 Yize iziPhinqi ziyi zinto ezibengeza  
 kakhulu kuMkhatshilibe, zaphakanyiswa  
 eminyakeni engama-60 eyedlile nje.  
 Inhlabanthosi amanzi esuka ezintweni  
 zomkharthi yayisiqoshiwe  
 ngalesasikhathi. Ngesikhathi  
 zimfunzindalo zomkharthi zizama  
 ukuthola izindandazo ezilambisana  
 nalezi ziphafuko, zathola ukuthi izifuba  
 ezininzi leziphafuko ezizathlekile  
 ziqukethe izinsankanyezi ezisilulalwa  
 futhi ezithi azibe kulhaza kuhle  
 kwesibhakabhaka.  
 Umungcw walezi zinto wakhombisa  
 ukuthi lezi zinto zikude kakhulu  
 (ngaphandle komThalakazi wethu, kude  
 ukudlula imiThalakazi eyayaziwa  
 ngaleso sikhathi) kanti futhi  
 zazingasizona iziNkanyezi. Zanikezwa  
 igama iziPhinqi (ziNkanyenzi).



Umhlahlwesi wesiPhinqi

IsiGwinqa esikhulu (ububanzi obu-1 kumjijibe  
 wehora) ingungwe isicaba esihesayo (radius  
 1 kumjijibe wenyanga) esivuthela isiGwinqa,  
 isicaba sikhafula iminyonzi edushulana  
 namafana.  
 Isicaba sikhumene neNkatha eluthuli, eyi-  
 1 000 kumjijibe ububanzi. lapho sibukwa  
 kunqenqema, isicaba sehlumelo asibonakali.  
 iziShwila zezinhlayiyane ezisuka kwisiGwinqa,  
 zihesheka kwisicaba. Ziphelela kumadlebe  
 lemanzi, alingamiselwa kwisigidi kumjijibe  
 ubukhulu.