

Inyanga ye-Antarctica Ingabe ubuwazi nje?

1. I-Antarctica, i-Afrika, i-Arabia, i-Australia, i-New Guinea, i-India, i-Madagascar, i-South America kanye ne-New Zealand lawa mazwe ake aba yingxenye yezwekazi elikhulu kakhulu elaliseningizimu elalaziwa ngokuthiwa yi-Gondwana.
2. Okumangazayo, wukuthi i-Afrika ne-Antarctica kwakuyizwekazi elilodwa, isizinda samanje esise-Antarctica seNingizimu Afrika (i-SANAE-IV) siqhwakele phezu kwedwala eliyingxenye enkulu ephumele ngaphezulu komhlaba wedwala i-Karoo - cishe ibanga elingamakhilomitha ayizi-5 000 ukusuka ekhaya.
3. Kuthatha izinsuku eziyi-15 ukuya e-Antarctica ngomkhumbi. E-Antarctica kuyiwa ehlobo kuphela, kusukela ngoDisemba kuya kuFebhuwari.
4. I-Antarctica yatholwa okokuqala ngo-1820, kanti umhloli wamazwe base-Norway nguye owafika kuqala Engxenyeni Engaseningizimu Yamaphethelo Omhlaba ngo-1911
5. Ungoti wezimo zezulu baseNingizimu Afrika wathatha ifulegi laseNingizimu Afrika waliyisa Engxenyeni Engaseningizimu Yamaphethelo Omhlaba ngo-1958, njengengxenye yeqembu lika-Sir Edmund Hillary eleqela ngale komhlaba wezwekazi - okwakuwuhambo olwathatha izinsuku ezingama-99.
6. U-J.J. la Grange wahola iqembu elathatha uhambo locwaningo lokuqala olwalusuka eNingizimu Afrika luya e-Antarctica (ku-SANAE-1), olwasukela eKapa ngo-1959 lafika e-Antarctica ekuqaleni kuka-1960, ukuze lifike lithathe isizinda okwakungesama-Norwegian.
7. INingizimu Afrika ingelinye lamazwe ayi-12 okuqala asayina Isivumelwano se-Antarctica (esamukelwa ngo-1959) futhi kwakungelinye lamazwe asungula i-Scientific Committee on Antarctic Research (i-SCAR).
8. Isivumelwano se-Antarctica senziwa ukuze kuqinisekise ukuthi ubunikazi be-Antarctica ababubangwa.
9. Iphrothokholi Yamazwe Ngamazwe emayelana Nokuvikelwa Kwezemvelo

isimemezele i-Antarctica 'njengesiqwi semvelo esizibophezele ekubeni nokuthula saphinde sazibophezela kwezesayensi.' Yingakho, izimpi zingavunyelwe kodwa kugququzelwa ucwaningo lwezesayensi kanye nokusebenzisana.

10. U-Dkt Aithne Rowse kwaba ngowesifazane wokuqala owachitha ubusika bonke ese-Antarctica. Wayeyilungu lethimba le-South African Antarctic Expedition (SANAE-36) elalinabantu abangama-36. Leli thimba kwakungelokuqala elachitha ubusika bonke kusizinda i-SANAE-IV, kusukela ngoFebhuwari ka-1997 kwaze kwaba ngunyaka olandelayo.
11. Kubantu abaningi baseNingizimu Afrika, impendukalanga (solstice) yasebusika eba ngomhla ka-21 kuJuni idlula kunganake muntu njengoba imini yayo imfushane kunayo yonke onyakeni. Kulezi Zakhumuzi zaseNingizimu Afrika eziyisishiyagalolunye ezise-Antarctica, loku kuphawula isigamu sesikhathi esiyizinyanga ezintathu zingaliboni sampela ilanga.
12. Njalo ngonyaka ngoJuni, i-South African National Antarctic Expedition (i-SANAE) kanye nezinye izizinda ezise-Antarctica zigubha impendukalanga yesikhathi esiphakathi naphakathi sobusika lapho ilanga liba kude kakhulu nenkabazwe ukwedlula ezinye izinsuku. Ngalesi sikhathi, ososayensi abasebenza e-Antarctica sebenezinyanga ezintathu bengaliboni ilanga, kanti zigubha isikhathi esiphakathi naphakathi salesi sikhathi, esiba ngoJuni, baba nemicimbi babambe nezinhlolongobho zamakhonsathi.
13. Ososayensi abase-Antarctica bacwaninga isimo sezemvelo esenzeka emkhathini, ku-atmosfiye yasemhlabeni kanye nongwengwesi olungaphandle lomhlaba (crust). I-Aurora Australis, noma i-Southern Lights, 'iyikhethini' lezibani ezidansa kamnandi kakhulu esibhakabhakeni. Zidalwa ukushayisana komoya welanga kanye ne-atmosfiye Yomhlaba.
14. Ngokucwaninga isimo sezulu kanye nezilwandle zase-Antarctica ngososayensi kubenza bakwazi ukuthola umkhondo mayelana nenqubo yokuguquka kwesimo sezulu emhlabeni wonke.
15. I-Antarctica iyizwekazi lesihlanu ngobukhulu, kodwa ayinabo abantu abahlala kuyo unomphelelo.
16. Alinganiselwa ku-80% amanzi amasha omhlaba akuleli liqhwa elemboze i-

Antarctica. Uma kungenzeka ukuthi leli khasi leqhwa lincibilike, amazinga olwandle emhlabeni wonke angenyuka cishe ngamamitha angama-75.

17. I-Antarctica iyizwekazi eline-althishudi (ubude bokuphakama phezu kolwandle) evamile ephakeme kakhulu impela ukusuka ezingeni lolwandle: ama-2 500m.
18. Amazinga okushisa avamile asebusika alinganiselwa ku: ama-40 degree Celsius, nakuba kwake kwarekhodwa amazinga okubanda okukhulu okwakungu: ama-89 degrees Celsius kusizinda sase-Vostok.
19. Kahle hle, i-Antarctica ingugwadule njengoba ingenayo iphresiphitheshini kodwa inezinhlayiya zeqhwa kanye nokukhithika kweqhwa. I-Antarctica yiyo enamazinga omswakama ovamile aphantsi emhlabeni.
20. Ugesi o-stethikhi e-Antarctica uyingozi enkulu kuzisetshenziswa zobu-elektronikhi ezizwelayo ezisetshenziswa ngososayensi.
21. Awekho amabhele aphila ezifundeni ezingamaphola e-Antarctica. Lokhu kufanele uma ucabanga ngegama i-Antarctica: i-*arktos* yigama lesiGrikhi elisho ibhele.
22. Azikho izinja zesihlibhi e-Antarctica. njengoba sekwaba khona izimoto zokuthutha, zonke izinja zakhishwa ngenhloso yokuvikela ezemvelo ekuqaleni kweminyaka yawo 1990
23. INingizimu Afrika nayo imatasatasa kakhulu eziqhingini ezibizwa ngokuthiwa yi-sub-Antarctic, esiqhingini i-Marion kanye Nasesiqhingini i-Gough.
24. Isizinda esisesiqhingini i-Marion eSouthern Ocean silokhu sigcinwa yiNingizimu Afrika, sons sisebangeni elingaphezudlwana kwama-2 000 km eningizimu mpumalanga yeKapa. Isiqhingini i-Marion kanye Nesisiqhingini i-Prince, iziqongo ezingamawele zentabamlilo, ziyingxenye yeqembu Leziqhingini ezibizwa i-Prince Edward.
25. Ngo-1995, Isiqhingini i-Gough kanye namanzi asizungezile kwanikezwa isikhundla sokuba Yisizinda Somhlaba Sezamagugu.
26. Eminyakeni engama-40 edlule, izinga lokushisa elivamile esiqhingini i-Marion

selenyuke cishe ngama-degrees Celsius amabili. Amazinga okushisa ase-Sub-Antarctica enyuka ngokushesha ukudlula ezinye izindawo emhlabeni.

27. Izinga lezimvula Esiqhingini i-Marion selehle cishe kusukela ku-3000 mm kuya ku-2500 mm ngonyaka, okungubufakazi bezinsolo zokuthi lesi siqhingi siya ngokufudumala futhi siyoma. Isiqhingi i-Gough inezimvula cishe ezingu-3 120 mm ngonyaka. Isivinini esivamile somoya Esiqhingini i-Gough silinganiselwa ku-60% okuyizinga eliphezulu kwalelo laseKapa.
28. Isiqhingi i-Marion siyikhaya lezinambuzane ezilinganiselwa kwezingama-45 zohlobo olwehlukahlukene.
29. Ezinye zezinto ezicwaningwa ngososayensi Esiqhingini i-Gough, zibandakanya umthelela wezinhlanzi kuzinyoni zasolwandle zalapha, kanye nomthelela wolunye uhlobo lwezilwanyana ezingena lapha (njengamagundane) kulezo zinyoni ezizalela ziphinde zichamisele amaqanda azo eziqhingini.
30. Ongoti besimo sezulu basiza ekubikezeleni isimo sezulu eNingizimu Afrika ngokuqaphelisisa nangezilinganiso e-Antarctica. Amaseli anazinga aphansi engcindezi azulazula kulo lonke izwekazi i-Antarctica, kanti kwesinye isikhathi yikho lokhu okudala umsinga obandayo eNingizimu Afrika. Isiqhingi i-Marion Nesiqhingi i-Gough yizo zombili iziteshi zesimo sezulu ezibaluleke kakhulu emhlabeni mayelana nezimboni zezolimo nezokutholakala olwandle.

Umlando we-Antarctica: amaphuzu nalokho okungelona iqiniso

- Kunenkulumompikiswano enkulu mayelana nokuthi ngubani kahle hle 'owathola' izwekazi i-Antarctica. UMholi Omkhulu Wemikhumbi Yezempi baseRashiya uThaddeus von Bellingshausen wabona ingxenye engasogwini yaleli lizwekazi ngomhla ka-27 Januwari 1820, kodwa wayengazi ukuthi yini leyo ayibona. Wakuchaza lokhu ebhukwini lakhe lelogi njengebala elikhulu elalineqhwa 'elalibonakala njengelimbozwe ngamangqunyana'. Emva kwezinsuku ezintathu, ngomhla ka-30 kuJanuwari, umkhumbi omncane owawuqashwe nguMnyango baseBrithani Wezempi owawulawulwa Ebukhosini ngaphansi kuka-Edward Bransfield, wabona umhlaba kulathishudi engama-64 degree eningizimu. Namuhla lokhu kwaziwa njenge-Antarctic Peninsula.
- Uhambo locwaningo lokuqala olwafika e-South Pole lwaluholwa ngumhloli wamazwe oyi-Norwegian u-Roald Amundsen. Bafinyelela enjongweni yabo ngempumelelo ngomhla ka-14 Desemba ku-1911 base bephindela ngokuphepha kusizinda sabo emavikini ambalwa emva kwalokho. Iqembu lohambo locwaningo laseBrithani elaliholwa nguKaputeni Robert Falcon Scott lafika e-South Pole ngomhla ka-18 Januwari ku-1912, kodwa wonke amalungu amahlanu alo leli qembu afela endleleni ebuyayo. Isizinda sase-US esise-South Pole sethiwa igama elithi i-Amundsen-Scott ngenhloso yokuhlonipha laba bancintisani ababili.
- Iqembu lokuqala elandizela e-South Pole laliholwa ngu-Richard Byrd base-United States. Lolu hambo ngendiza lwathathwa ngoNovemba ka-1929. U-Byrd nguye owasungula uhlelo lokuxhumana kokuphendulana ngomsakazo lapho abantu bekwazi ukuphendulana khona, waphinde wasungula nezimoto ezinamathrekha ukuze lokhu kusetshenziswe njengamathuluzi okuhlola leli lizwekazi Umuntu wokuqala owandizela ngale kwaleli lizwekazi kwaba ngesinye isakhumuzi saseMelika, u-Lincoln Ellsworth, ngo-1935. Wahamba amakhilomitha ayi-3 700 ngesikhathi sohambo lwakhe ngendiza.
- Umuntu wokuqala wesifazane owafika kuleli lizwekazi i-Antarctica kwakungu-Caroline Mikkelsen, ngoFebhuwari ka-1935. Umyeni wakhe kwakungukaputeni womkhumbi owayeyi-Norwegian wemboni yokuzingelwa kwemikhome Waya osebeni e-Vestfold Hills ogwini olusempumalanga naleli lizwekazi.
- Ukuwelela ngale kwaleli lizwekazi okokuqala okwaba yimpumelelo ngokusebenzisa isithuthi esihamba phansi emhlabeni kwaphothulwa yiqembu lohambo locwaningo i-Commonwealth Trans-Antarctic Expedition ngo-1958 Amaqembu amabili, elilodwa elaliholwa ngu-Sir Edmund Hillary

(okwakungomunye wabantu ababili bokuqala abafika esicongweni sentaba i-Mount Everest) elasuka kusizinda i-Ross emngceleni wosebe lolwandle kanti elinye iqembu elaliholwa ngu-Sir Vivian Fuchs lona lalisuka kuisizinda i-Weddell Sea emngceleni wosebe lolwandle. U-Hillary wafika kuqala e-South Pole, okwaba nguye owasungula uchungechunge lwamadepho u-Fuchs akwazi ukubasebenzisa ekuweleleni ngale-okuwuhambo lwezinsuku ezingama-99. Ungoti baseNingizimu Afrika wesimo sezulu, u-J.J. (U-Hannes) la Grange, wayeyilungu leqembu lika-Hillary, futhi nguye owayisa ifulegi laseNingizimu Afrika e-South Pole. U-La Grange nguye owayehola i-South African National Antarctic Expedition yokuqala (i-SANAE-1), eyasuka eKapa ngo-1959. Leli qembu lafika eshelufini yeqhwa elibambebele ezwenikazi elingasuki e-Fimbulisen ekuqaleni kuka-1960, lafika lathatha isizinda okwakungesase-Norway ('i-Norway Station') i-Dronning Maudland (i-Queen Maud Land) emva kokuthi i-Norwegian Antarctic Expedition iphumile kuso.

- Owesifazane wokuqala owachitha ubusika bonke e-Antarctica kwakungu-Dkt Aithne Rowse. Wafika e-Antarctica ngoFebhuwari ka-1997, wayengudokotela we-SANAE-36. Wabuyela eNingizimu Afrika ngonyaka olandelayo. I-SANAE - 36 kwakuyiqembu lokuqala elachitha ubusika kusizinda se-SANAE-IV. (Izizinda zama-SANAE zihlonzwa ngezinombolo zamaRoma. I-SANAE-I kwakuyisizinda saseNorway phambilini, kanti i-SANAE-II ne-III zakhiwa ngamalungu oMnyango Wezemisebenzi KaHulumeni ngo-1971 nango-1979 ngokulandelana kwazo.)

Inyanga ye-Antarctica: ikhasi lamaqiniso esayensi

- Yini i-SCAR?

Ngokucacile, lo msebenzi wezesayensi wamazwe ngamazwe owenziwa e-Antarctica uhlelwe, wathuthukiswa futhi wahlanganiswa yiKomidi Lezesayensi elibhekelele Ucwangingo Lbase-Antarctica. Le nhlangotho yahlalelwa yi-International Council of Scientific Unions (i-ICSU) ngoSeptemba ka-1957. INingizimu Afrika ngenye yamalungu aqala i-SCAR.

- Iyini indima edlalwa nguMnyango WezeSayensi NobuChwepheshe?

UMnyango WezeSayensi NobuChwepheshe uhlanganisa, uhlale ubuye uxhase amaphrojekthi ocwangingo lbase-Antarctica enziwa yi-South African National Antarctic Programme (i-SANAP).

- Ucwangingo lbase-Antarctica olwenziwa yiNingizimu Afrika lugxila kuphi?

Ucwangingo lbase-Antarctica olwenziwa yiNingizimu Afrika lugxile ezindikimbeni ezinhlanu ezinkulu ezidingida ezesayensi yomhlaba (i-geosciences), ezesayensi yesimo somhlaba (i-physical science), ezesayensi yempilo, umthelela wokuba khona kwabantu e-Antarctica kanye nomlando, ezesayensi ephathelene nokuhlalisana kwabantu nezombusazwe zokuba khona kwethu kulesi sifunda okuzothatha isikhathi eside.

- Yingani i-Antarctica kuyindawo enhle efanele lolu cwangingo olumayelana nesimo somkhathi oseduze komhlaba (i-geospace), kanti futhi yingani lolu cwangingo lubalulekile?

Lokhu kubuye kwaziwe ngokuthi ngumthelela welanga ku-atmosfiye nasemhlabeni, 'ngesimo somkhathi oseduze nomhlaba' kushiwo ukwenzelana phakathi komhlaba nelanga ngenxa yomphumela wezimo ezihlukahlukene zezinhlayiya (ama-particle), umthelela wamandla ezikhundleni ezithile kanye nerediyeshini. Umhlaba uzungezwe yisikhundla esizungezwe wuzibuthe (magnetic field), esibuye sibizwe ngokuthiwa yimagnethosfiye, esimise okwe-ring doughnut lapho inkaba yayo noma uphakathi naphakathi layo ingumhlaba Isikhundla esizungezwe wuzibuthe sihlanguana senze amakhoni amabili, sihlanguane nomhlaba Njengoba i-Antarctica iyizwekazi, ihlinzeka ngendawo esezingeni eliphezulu mayelana nokusetshenziselwa ucwangingo kulawa makhoni (I-Arctic ineqhwa elintantayo elingapheli elihluka kakhulu ngobugqinsi balo nangendawo ekulo, lokhu kuhluka kwalo kuhambisana nezikhathi zonyaka). Uma sibheka ilanga, ucwangingo lweminyaka lukhombise ukuthi ilanga likhipha ukukhanya ngemisebe, ngamagagasi obu-elektromagnethikhi kanye nangezinye izinhlayiya ezinamashaji. Amandla okukhishwa ale radiyeshini kanye nenani lezinhlayiya kuyehluka ngoba kuhambisana nalokho okwenziwa yilanga. Lokhu kubizwa ngokuthiwa 'isimo sezulu emkhathini' futhi silandela imijikelezo yonyaka eyi-11 nengama-22. Iningi lezindawo ezisemhlabeni zivikelwe yimagnethosfiye kulokho okwenziwa yilanga (ngaphandle kokukhanya), kodwa 'izikhala' ezisezindaweni ezisekugcineni komhlaba zenza ukuthi i-plasma ilandele imizila yesikhundla esizungezwe wuzibuthe iye ku-atmosfiye engaphezulu. Lapha zidedela amanye amandla azo abonakala njengokukhanya - njengendlela umfanekiso ovela eskrinini sethelevishini owenzeka ngayo. Lokhu kubizwa ukukhanya (aurora) izibani zasenyakatho (Aurora Borealis) nezibani zaseningizimu (Aurora Australis). Uma sifunda ngalezi zimo kanye nokunye okwenzekayo okuhlobene nazo, singaliqonda kangcono ilanga, imagnethosfiye kanye ne-atmosfiye engaphezulu kanye nemithelela yalokhu emhlabeni. Isathelayithi idlala indima enkulu ekuxhumaneni nasehambiseni

nasekuqondiseni kwemikhumbi nezindiza, kanye nomumo wolwandle, isayensi yesimo nomumo sezulu kanye nolunye uhlobo lwezesayensi yomhlaba - kanti isimo sezulu emkhathini singaba nomthelela omubi kwezobuchwepheshe bethu obusemkhathini. Ngokufanayo unqenqema lomoyamkhathi (i-ozone layer) luvikela impilo emhlabeni kuradiyeshini yemisebe yelanga. 'Izimbobo' kulolu nqenqema lomoyamkhathi zivumela ukudlula kwale radiyeshini kuzo.

Ubufakazi bokuqala boshintsho olukhulu kulolu nqenqema lomoyamkhathi babonwa e-Antarctica. ukuba newindi emkhathini oseduze komhlaba kungaletha ukusizakala kwangempela nokubonakalayo!

- Yingani kwenziwa ucwaningo mayelana nezesayensi yokwakheka komhlaba e-Antarctic?

Siyabonga ngokwakheka komhlaba e-Antarctica, kusikhombisa kahle kakhulu maqondana nenguquko noma nokusombuluko komkhakha owemboze ingaphezulu lomhlaba eminyakeni elinganiselwa kumabhiliyoni amathathu eminyaka.

Ucwaningo lwezesayensi yokwakheka komhlaba lungaveza ulwazi oluningi mayelana nokuguquguquka kwesimo sezulu ngalezi sikhathi - okungasetshenziselwa ukuqonda nokulinganisa uguquguquko lomumo sezulu esikhathini samanje nasesikhathini esizayo.

- Iyini inhlukano yempilo yezitshalo neyezilwane?

Inhlukano yempilo yezitshalo neyezilwane (i-biodiversity) kusho ukuba khona koshintsho olukhulu noma oluncane ezimweni zempilo nasendleleni yokuphila endaweni ethile noma esimweni esithile kungaba yinkomba ebaluleke kakhulu yesimo sezempilo sezemvelo. Ziningi izimo ezingaba nomthelela kunhlukano yempilo yezitshalo neyezilwane, kubandakanya imijikelezo yemvelo nezinguquko zemvelo, ukuba khona kwezinhlobo zezinto eziphilayo kanye nomthelela wokuba khona kwabantu kanye nalokho abakwenzayo. Lawa maphuzu kungenzeka enzelane. Uma kudidiyelwa ndawonye umsebenzi wabacwaningi bezesayensi yomumo wolwandle, abacwaningi bezesayensi yokuphilayo kanye nabacwaningi bezesayensi yomumo womhlaba e-Antarctica, i-Southern Ocean kanye neziqhingi ze-sub-Antarctica (njenge-Marion ne-Gough), kungaba nesithombe esigcwele senhlukano kulezi zifunda, esingahlinzeka ngezinkomba zemithelela zenguquko yomumo sezulu emhlabeni.

- Yiziphi ezinye izinhlelo zamanje zocwaningo?
1. Uhlelo **i-SHARE** (Southern Hemisphere Auroral Radar Experiment) e-SANAE-IV luyingxenye yohlelo lwe-SuperDARN lwamazwe ngamazwe. (Lolu hlelo selwenze ucwaningo olubalulekile mayelana nemagnethosfiye ne-iyonisfiye, luhlinzeke ngedatha yokubikezelwa kwesimo sezulu emkhathini. Ngo-1998, uhlelo i-SuperDARN laklonyeliswa ngendondo i-NASA ngomsebenzi walo emkhakheni wocwaningo lomkhathi oseduze komhlaba.
 2. Uhlelo **i-AMIGO** (Antarctic Magnetospheric and Ionospheric Ground-based Observations) lwenziwa ku-SANAE-IV yiNyuvesi yase-North-West kanye neNyuvesi yakwaKwaZulu-Natal.
 3. **I-ANOKS** (Antarktiese Navorsing oor Kosmiese Strale yi-Antarctic Research about Cosmic Radiation) icwaninga ngespekthramu yamandla (energy spectrum) wamakhosmikhireyi ngokusebenzisa i-neutron monitor ye-SANAE-IV.
- Yiluphi ucwaningo lwezesayensi yezinto eziphilayo olwenziwa eziqhingini i-Prince Edward?

Kunezindikimba ezine ezibalulekile:

1. ukuhlanguka phakathi kwezinhlelo zolwandle nezomhlaba;
2. umlando wempilo yezimvu zamanzi, izinyoni kanye nemikhomo eyaziwa ngokuthi yi-orcas (ama-killer whale);
3. ukwakheka nokusebenza kwama-ekhosistimu emhlabeni; kanye
4. nokwakheka nokusebenza kwama-ekhosistimu aseduze nasosebeni.

lolu cwano luhlinzeke ngolwazi oluhle kakhulu mayelana nenhlukano yempilo yezitshalo neyezilwane Eziqhingini ze-Prince Edward.

- Yiluphi ucwaningo lwezesayensi yezinto eziphilayo olwenziwa Esiqhingini i-Gough?

Imikhakha ebalulekile yocwaningo mayelana Nesiqhingi i-Gough ibandakanya:

1. umthelela wokudweba kwezinhlanzi kuzinyoni zasolwandle ezidabuka kulezi ziqhingi nezitholakala kuzo kuphela; kanye
2. nomthelela wezinhlabo zezilwanyana ezifikayo (ikakhulukazi amagundane) ekubekeni amaqanda nasekuchamuseleni kwezinyoni eziqhingini.

Ucwaningo ngenhlukano yempilo yezitshalo neyezilwane emhlabeni osesiqhingini lukhombise ukuthi kukhona izinhlobo ezingama-71 zezinambuzane zokufika, kodwa ezokudabuka zenza okukodwa kokuthathu kuphela.



Inyanga ye-Antarctica: ikhasi lamaqiniso esayensi 'Sola ijomethri'

Impendukalanga ingachazwa ngezindlela eziningi, kodwa zimbalwa ezichaza ngemekheniksi yalesi simo. Okokuqala, impendukalanga kungathiwa yizikhathi lapho ilanga liba kude nenkabazwe ukudlula ezinye izikhathi ngalowo nalowo nyaka. Futhi yisikhathi lapho ilanga lime thwi ngaphezu Kwenjika Yenkalankala (i-Tropic of Cancer) eseNyakatho Nenkabazwe, noma Injika Yempunzi (i-Tropic of Capricorn) eseNingizimu Nenkabazwe Ngesikhathi kuba khona impendukalanga yehlobo eNyakatho Nenkabazwe (engomhla ka-21 kuJuni), lokhu kwenza ukuthi lolu hlangothi lwenkabazwe lube nosuku olude kunezinye izinsuku onyakeni, ngesikhathi iNingizimu Nenkabazwe iba nobusuku obude kunabo bonke onyakeni. (Lesi simo siyahlehla ngesikhathi sempendukalanga yesibili yonyaka, engomhla ka-22 Disemba.

Lezi zincazelo zishaya khona, kodwa ziyadukisa kancane ngoba zenza kucatshangwe ukuthi ilanga liya ezulwini. Kodwa njengoba sazi, umhlaba uzungeza ilanga. Ukuze siqonde ukuthi yingani izimpendukalanga zenzeka, kuhle kakhulu ukuqonda ukuhamba komhlaba kuqala. Umhlaba ujikeleza ku-ekzisi yawo kanye njalo emahoreni angama-24, okwenza ukuthi kube nomjikelezo wobusuku nemini. Ngaso lesi sikhathi usuke uzungeza ilanga uhamba ku-obhithi yawo, ukuphothula ukuzungeza ilanga ku-obhithi yawo kuthatha unyaka owodwa, noma izinsuku ezingu-365,25.

Manje nakhu okudidayo. Thatha ngokuthi i-obhithi yomhlaba isemzileni oyisicaba ongabonakali ofana nediskhi emise saqanda lapho ilanga limile linganyakazi enkabeni yayo. I-eksizi yomhlaba ojikeleza kuyo ayikho kuma-engele aqondile maqondana nomzila oyisicaba, kodwa itsheke ngo-23,5°. Lokhu kutsheka akushintshi njengoba umhlaba uzungeza ilanga ku-obhithi yawo, okwenza ukuthi i-engele imisebe yelanga eshaya ngayo izingxenye ezihlukahlukene zomhlaba zishintshe kuwo wonke unyaka. Njengoba umhlaba uzungeza ilanga ube utshekile ku-obhithi yawo, kulowo osemhlabeni obhekile uyaye abone sengathi ilanga lihamba phakathi kweNyakatho neNingizimu ngokushintsha kwezikhathi zonyaka, njengoba kubonakala sengathi usuka eMpumalanga uye eNtshonalanga ngokuhamba kosuku. Uma kubonakala sengathi ilanga liphezulu ngokuqondana ngqo Nenjika Yenkalankala (23,5° eNyakatho) noma Nenjika Yempunzi (23,5° eNingizimu), kuyaye kube khona impendukalanga. (Ilathishudi yezinjika ingumphumela ngqo we-engele yokutsheka.)

Impendukalanga yasebusika baseNyakatho Nenkabazwe iyimpendukalanga yasehlobo laseNingizimu Nenkabazwe, kanti lokhu kwenzeka ngokuphendulela. Ukutsheka komhlaba kuphinde kudale ukuthi ilanga linyamalale liye ngaphansi komkhathizwe (i-

horizon) ebusika e-Arctic, nase-Antarctica kanti libe ngaphezulu komkhathizwe ehlobo (okubizwa 'ilanga laphakathi kwamabili'). E-Antarctica ilanga liyaye lingaphumi cishe izinyanga ezintathu ebusika, lapho impendukalanga yasebusika iba maphakathi nalesi sikhathi.

E-Antarctica, impendukalanga ivame ukugujwa kuzo zonke izizinda nezisebenzi ezichitha ubusika bonke lapha. Lokhu bekulokhu kwenziwa kusukela ezinsukwini zokuqala zokuhlola izwe kunyakakhulu wama-20. Kuyaye kugujwe ngokuthi kwenziwe ilantshi noma idina, bese kuza wonke umuntu okusizinda. Kule migubho kuyaye kugqokwe ubukhazikhazi bezingubo, nalapho izizinda eziningi zibamba izinhlobonhlobo zamakhonsathi, zishicilele namajenali ezikhumbuzo, amalungu eqembu aveze amathalente awo.

Inyanga ye-Antarctica: ikhasi lamaqiniso Esivumelwane se-Antarctica

- Umkhondo wendabuko Yesivumelwano se-Antarctic ungalandelelwa kunyaka i-International Geophysical Year (i-IGY), nakuba kungekho ukuxhumana ngqo nawo, okwathatha isikhathi esiyizinyanga eziyi-18 kusukela ngomhla ka-1 Julayi ku-1957 kuya ngomhla ka-31 Disemba ku-1958. Lesi sikhathi sokusebenzisana kwezesayensi kwamazwe ngamazwe kubandakanya ososayensi abavela emazweni angama-67 futhi ayegxile ekuhloleni umkhathi kanye ne-Antarctica. Impumelelo ye-IGY ehlanganisa nokwenyuka kakhulu kwenani lezinto ezazenziwa e-Antarctica, kwaveza ukuthi kudingeka uhlaka lwezombusazwe ukuze kuthuthukiswe ukuzwana phakathi kwamazwe ngamazwe kulesi sifunda. Ngalesi sikhathi, kbase kuvele kunamazwe ayisikhombisa (okuyi-Argentina, i-Australia, i-Chile, i-Ecuador, i-France, i-New Zealand, i-Norway ne-United Kingdom) ayeseqalile ukuthi anezindawo okungezawo kuleli lizwekazi nokuthi izilwandle ezizungeze leli lizwekazi zingezawo. Lokhu akuzange kwamukelwe yizo zonke izinhlangano - kwacaca ukuthi kudingeka ukuthi kwenziwe isivumelwano esithile samazwe ngamazwe.
- Isiphakamiso se-Chile, esasaziwa ngokuthiwa yi-1948 Escudero Declaration, sasetshenziswa njengesisekelo sokuxoxisana. Ngenxa yalokhu kuxoxisana kwaba nesiphakamiso sokuvimbela lezi zingxabano ezimayelana nozibuse iminyaka emihlanu, kwaphakanyiswa ukuthi amaqembu ohambo lwezocwaningo angaweli ngaphansi kwanoma yiliphi iqembu lezombusazwe kwaphakanyiswa nokuthi kube nomgomo wokungena ngokukhululeka kulesi sifunda ukuze kuqhutshwe ucwaningo lwezesayensi.
- Labo ababemele amazwe abo ayi-12 babevame ukuba nemihlangano e-Washington

kusukela ngo-1958 kufikela ngo-1959 ngenhloso yokuxoxisana ngeziphakamiso nangokwenziwa kohlaka lwesivumelwane. Ngomhla ka-1 Disemba ka-1959, kwasayinwa Isivumelwano se-Antarctica yilabo ababemele ohulumeni base-Argentina, base-Australia, base-Belgium, base-Chile, base-France, base-Japan, base-New Zealand, base-Norway, base-Ningizimu Afrika, okwakuyi-USSR phambilini, i-UK ne-USA. Eqinisweni isivumelwano saqala ukusebenza ngomhla ka-23 Juni ka-1961, kanti amazwe asayina lesi sivumelwane ayaziwa ngokuthi ngamazwe ayi-12 abamba iqhaza ezingxoxweni.

- Isivumelwano i-Antarctic siqukethe ama-athikhili ayi-14, anale migomo elandelayo:
 - I-Antarctica (okusho isifunda sonke esiseningizimu nelathishudi engu-60% eNingizimu) kumele isetshenziselwe ukuthula noxolo, futhi azivunyelwe izizinda zezempi, akuvunyelwe ukuvivisa noma ukuphaka izimpi futhi akuvunyelwe ukuhlola izikhali zempi. Izinto ezingavunyelwe zifaka phakathi neziqhumane zenuzi kanye nokulahlwa kukadodi odalwe yinuzi.
 - Kumele kugqugquzelwe kakhulu ukuthuthukisa ucwaningo lwezesayensi nokusebenzisana, ukushintshana ngolwazi, izinhlelo imiphumela kanye nezisebenzi. Lokhu kufaka phakathi ukungena ngokukhululeka ngenhloso yokwenza ucwaningo lwezesayensi.
 - Ukwenza umhlaba ube ngowakho akwamukelekile, kuphikiswana nakho futhi akuhambisani nesivumelwane, futhi abukho obunye ubunikazi obusha bomhlaba obuzokwamukelwa.
- Isivumelwano sokuqala sesichitshiyelwe futhi selulwa, kwenziwa Uhlelo Lwesivumelwano se-Antarctica, olubandakanya izivumelwano phakathi kwamazwe kanye nezincomo ezenziwa emihlanganweni evamile.
- Ingxenye eyodwa ebaluleke kakhulu kunezinye izingxenye Zohlelo Lwesivumelwano se-Antarctica, yiPhrothokholi Emayelana Nokuvikelwa Kwezemvelo (ebuye yaziwe ngokuthiwa yi-Madrid Protocol). Lokhu kwenza ukuthi i-Antarctica ibe 'yisiqwi sezemvelo esizibophezele ekuthuleni noxolo nakwezesayensi' futhi wonke lawo malungu abamba iqhaza ezingxoxweni avuma ukuzibophezela ekutheni lokho azobe ekwenza e-Antarctic kuzodlala indima ekulawulweni kwezemvelo.
- NgoMeyi ka-2000, amanye amazwe ayi-15 (okuyi-Brazil, i-Bulgaria, i-China, i-Ecuador, i-Finland, i-Germany, i-India, i-Italy, i-Netherlands, i-Poland, i-Peru, i-Republic of Korea, i-Sweden, i-Spain ne-Uruguay) nawo anikezwa izikhundla zokubamba iqhaza ezingxoxweni. I-Russia yathatha amalungelo akhethekile kanye nemisebenzi ye-USSR.

- Amanye futhi amazwe ayi-17 (i-Austria, i-Canada, i-Colombia, i-Cuba, i-Czech Republic, i-Democratic People's Republic of Korea, i-Denmark, i-Greece, i-Guatemala, i-Hungary, i-Papua New Guinea, i-Romania, i-Slovak Republic, i-Switzerland, i-Turkey, i-Ukraine, ne-Venezuela) avumelana nalesi sivumelwano. Anikezwa izikhundla zokuba yizingqapheli emihlanganweni yokuxoxisana.
- Amazwe angama-44 esehlangene wonke ayingxenywe Yesivumelwano se-Antarctica amele cishe okubili kokuthathu kwenani labo bonke abantu emhlabeni.
- Njengamanje iNingizimu Afrika yiyo kuphela emele izwekazi lase-Afrika.
- Inkomfa Yomhlaba yama-28 emayelana ne-Antarctica yabanjelwa e-Stockholm kusukela ngomhla wesi-6 kuya kumhla we-17 kuJuni kulo nyaka. Izinto ebeziku-ajenda bezibandakanya umthelela wokushisa kakhulu komhlaba kanye nezokuvakasha e-Antarctica.