PZz\_© Aa¨vq

1987 mv‡ji †deªyqvwi gv‡mi 23 wK 24 ZvwiL iv‡Zi K\_v| KvbvwWqvb †R¨vwZwe©` Bqvb †kjUb KvR KiwQ‡jb jvm K¨v¤úvbvm ch©‡eÿY‡K‡›`ª| RvqMvUv wPjxq Avw›`‡Ri P~ovq| GKRb ˆbk mnKvwi wKQz mg‡qi R‡b¨ evB‡i G‡jb| Ajm †Pv‡L ZvKv‡jb AvKv‡kj w`‡K| iv‡Zi AvKvk Zvi bL`c©‡Y| d‡j A¯^vfvweK `„k¨Uv †Pv‡L co‡Z mgq jvMj bv| jvR© g¨v‡RjvwbK K¬vDW bv‡gi M¨vjvw·i bxnvwiKvi `v‡Mi cÖv‡šÍ GKwU bZzb bÿÎ| D¾¡jZv AZ †ewk bq| Kvjcyiæ‡li †Kvgie‡Üi (Orion belt) ZviKv¸‡jvi KvQvKvwQ D¾¡j| me‡P‡q eo K\_v n‡jv, Av‡Mi w`b bÿÎUv ILvbUvq wQj bv|

mnKvwi mv‡ne e¨vcviUv †kjUb‡K ej‡jb| K‡qK NÈvi g‡a¨ LeiUv ivóª n‡q †Mj| †kjUb Avi Zvi wPjxq mnKvwi GKwU mycvi‡bvfv Avwe®‹vi K‡i †d‡j‡Qb| 1604 mv‡j †Rvnv‡bm †KcjviI Lvwj †Pv‡L GKwU mycvi‡bvfv †`‡LwQ‡jb| Zvic‡i Lvwj †Pv‡L GB cÖ\_g Avevi †Kv‡bv mycvi‡bvfv aiv coj| Gi ciciB †ek K‡qKwU †`‡ki †R¨vwZwe©`iv jvR© g¨v‡RjvwbK K¬vD‡Wi †cQ‡b hš¿cvwZ Kv‡R jvMv‡Z ïiæ Ki‡jb| c‡ii gvm¸‡jv‡Z 1987G bv‡gi mycvi‡bvfvwUi LyuwUbvwU Lye m~ÿ¥fv‡e we‡kølY Kiv nj|

†kjU‡bi PvÂj¨Ki Avwe®‹v‡ii K‡qK NÈv Av‡M wfbœ GKwU RvqMvq Av‡iKwU A¯^vfvweK NUbv wjwce× nw”Qj| G RvqMvUv Rvcv‡b| f~wgi A‡bKUv Mfx‡i KvwgIKv `¯Ív Lwb| GK eyK ¯^cœ wb‡q wKQz c`v\_©we` GLv‡b GK `xN©‡gqv`x cixÿv Pvjvw”Q‡jb| Zvu‡`i jÿ¨ wQj e¯‘i Ab¨Zg †gŠwjK Dcv`vb †cÖvUb KwYKvi P~ovšÍ w¯’wZkxjZv cixÿv Kiv| 1970 Gi `k‡K iwPZ MÖ¨vÛ BDwbdv‡qW w\_Iwi Abymv‡i †cÖvUb Lye Aw¯’wZkxj n‡Z cv‡i, hv GK ai‡bi †ZRw¯ŒqZvi d‡j mgq mgq ÿq n‡q \_vK‡Z cv‡i| GUv mwZ¨ n‡j gnvwe‡k^i fwel¨Z wbav©i‡Y Gi ¸iæZ¡c~Y© f~wgKv \_vK‡e| GUv Avgiv c‡ii Aa¨v‡q †`Le|

†cÖvU‡bi ÿq cixÿvi R‡b¨ Rvcv‡bi cixÿKiv GKwU U¨vsK‡K 2000 Ub AwZweï× cvwb w`‡q c~Y© Ki‡jb| Gi Pvicv‡k ivL‡jb D”P-ms‡e`bkxj †dvUb wW‡UKUi| wW‡UKU‡ii KvR wQj Av‡jvi SjK Lyu‡R †ei Kiv| GLv‡b Ggb Av‡jv ïay D”P MwZi †cÖvUb ÿ‡qi gva¨‡gB Avm‡Z cv‡i| cixÿvi R‡b¨ f~wgi Mfx‡ii ¯’vb †e‡Q †bIqv n‡qwQj gnvRvMwZK wewKi‡Yi cÖfve Kgv‡bvi R‡b¨| Ab¨\_vq AcÖZ¨vwkZ m‡¼‡Z †c‡Z †c‡Z AKvh©Ki n‡q IVZ wW‡U±i|

†deªæqvwii 22 ZvwiL| nVvr K‡i KvwgIKv wW‡U±i¸‡jv GMv‡iv †m‡K‡Ûi e¨eav‡b AšÍZ mgvb msL¨K m‡¼Z w`j| Gw`‡K c„w\_exi Ab¨ cÖv‡šÍ InvB‡qvi më gvB‡b GKB iKg GKwU wW‡U±‡i aiv coj AvUwU m‡¼Z| GK mv‡\_ GZ¸‡jv ÿq n‡q hv‡e GUv G‡Kev‡iB Awek^vm¨| Aek¨B Ab¨ †Kv‡bv e¨vL¨v \_vK‡e Gi| c`v\_©we`iv kxNªB †m e¨vL¨vUv †c‡qI †M‡jb| Zvu‡`i wW‡U±‡i aiv cov †cÖvUb ÿ‡qi KviY Ab¨ GKwU ¯^vfvweK cÖwµqv| †mUv n‡jv wbDwUª‡bvi AvNvZ|

wbDwUª‡bviv GK ai‡bi AwZcvigvYweK KYv| mvg‡bI G‡`i K\_v AviI Avm‡e| ZvB GLbB LvwbKUv we¯ÍvwiZ †R‡b †bIqv `iKvi| 1931 mv‡j DjdM¨vs cvDwj cÖ\_g G‡`i Aw¯Í‡Z¡i aviYv †`b| G ZvwË¡K c`v\_©we‡`i Rb¥ Aw÷ªqvq| †ZRw¯Œq cÖwµqvi †eUv ÿq bvgK A¯úó w`KwU e¨vL¨vi R‡b¨ G aviYv †`b wZwb| GKwU mvaviY †eUv ÿq cÖwµqvq GKwU wbDUªb †f‡O wM‡q GKwU †cÖvUb I GKwU B‡jKUªb Drcbœ nq| B‡jKUªb A‡cÿvK…Z nvjKv KYv n‡jI D‡jøL‡hvM¨ cwigvY kw³ mv‡\_ wb‡q †ei n‡q hvq| wKš‘ mgm¨v n‡jv cÖwZwU ÿq cÖwµqvq B‡jKUªb wfbœ wfbœ cwigvY kw³ wb‡q †ei nq| wbDUª‡bi ÿq †\_‡KI cÖvß †gvU kw³ †\_‡KI wKQzUv Kg| †h‡nZz me †ÿ‡ÎB †gvU kw³i cwigvY aªæe, g‡b n‡”Q P~ovšÍ kw³ cÖv\_wgK kw³ †\_‡K Avjv`v| GUv nevi K\_v bq| KviY, kw³ msiwÿZ \_vK‡e- GUv c`v\_©we`¨vi GKwU †gŠwjK bxwZ| ZvB cvDwj cÖ¯Íve Ki‡jb, H nviv‡bv kw³UzKz Ab¨ †Kv‡bv A`„k¨ KYv wb‡q P‡j hv‡”Q| KYvwU‡K kbv‡³i cÖv\_wgK †Póv Amdj| GUv Rvbv n‡q †M‡j †h GB KYv‡`i Aw¯ÍZ¡ \_vK‡jI †f`bÿgZv n‡e AZ¨vwaK| Avgiv Rvwb, ˆe`y¨wZKfv‡e PvR©hy³ †h‡Kv‡bv KYv e¯‘ Øviv Ave× n‡e| d‡j cvDwji cÖ¯ÍvweZ KYvwU‡K Zwor cÖkg n‡Z n‡e| †Kv‡bv PvR© \_vK‡e bv) GR‡b¨B Gi bvg †`Iqv n‡jv wbDwUª‡bv| (wbDUªvj (neutral) gv‡b cÖkg-Abyev`K)

†m mgq †KD wbDwUª‡bvi †`Lv bv †c‡jI ZvwË¡Kiv Gi AviI A‡bK¸‡jv ˆewkó¨ †R‡b †Mjb| GKwU ˆewkó¨ n‡jv wbDwUª‡bvi fi wb‡q|

`ªæZMvgx KwYKv‡`i †ÿ‡Î fi wb‡q GKUz mveav‡b K\_v ej‡Z nq| KviY, e¯‘i fi wbw`©ó bq| wbf©i K‡i †e‡Mi Ici| †Wgb GK †KwR IR‡bi GKwU wmmvi e‡ji K\_v fvev hvK| GwU hw` †m‡K‡Û 2 jÿ 60 nvRvi wK.wg. †e‡M P‡j Z‡e Gi fi n‡q hv‡e 2 †KwR| GLv‡b bv‡Ui ¸iæ Avm‡j Av‡jvi †eM| †Kv‡bv e¯‘i †eM Av‡jvi †e‡Mi hZ Kv‡Q hv‡e, Gi fi ZZ †ewk n‡e| f‡ii GB e„w×i †kl †bB †Kv‡bv| fi Gfv‡e e`‡j hv‡”Q e‡j weåvwšÍ Gov‡bvi j‡ÿ¨ AwZcvigvYweK KYv‡`i fi ejvi mgq c`v\_©we`iv wbðj f‡ii K\_v e‡jb| KYvwU Av‡jvi KvQvKvwQ †e‡M ågY Ki‡j Gi cÖK…Z fi wbðj f‡ii eû¸Y n‡q †h‡Z cv‡i| KYv Z¡iKh‡š¿i †fZi cÖ`wÿYiZ B‡jKUªb I †cÖvUb‡`i fi Zv‡`i wbR wbR wbðj f‡ii eû¸YI n‡Z cv‡i|

wbDwUª‡bvi wbðj fi Rvbvi Dcvq GKwU Av‡Q e‡U| A‡bK †ÿ‡Î †eUv ÿq cÖwµqvi mgq B‡jKUªb wbM©Z n‡ZB cy‡iv kw³ e¨q n‡q hvq| wbDwUª‡bvi R‡b¨ wKQzB evwK \_v‡K bv| Zvi gv‡b Awbevh©fv‡eB wbDwUª‡bv‡K wU‡K \_vK‡Z nq †Kv‡bv kw³ QvovB| GLb, AvBb÷vB‡bi weL¨vZ E = mc2 m~Î Abymv‡i fi Ges kw³ mgZzj¨| Zvi gv‡b, kw³ †bB gv‡b fiI †bB| Zvi A\_© `vuovq, m¤¢eZ wbDwUª‡bvi wbðj fi Lye Aí| n‡Z cv‡i k~b¨I| wbðj fi mwZ¨B k~b¨ n‡j wbDwUª‡bv Pj‡e Av‡jvi MwZ‡Z| Avi Zv bv n‡jI Gi †eM Av‡jvi †e‡Mi Lye KvQvKvwQB n‡e|

AwZcvigvYweK KwYKv‡`i N~Y©‡bi mv‡\_ Av‡iKwU welqI RwoZ Av‡Q| wbDUªb, †cÖvUb I B‡jKUªb mevB‡K me mgq Nyi‡Z †`Lv hvq| N~Y©‡bi gvÎv wbw`©ó| Ges wZbwUi †ÿ‡ÎB gvÎvUv mgcwigvY| N~Y©Y n‡jv GK ai‡bi †KŠwYK fi‡eM| †KŠwYL fi‡e‡Mi msiÿYkxjZv bv‡g GKwU m~Î Av‡Q| kw³i msiÿYkxjZv bxwZi g‡ZvB GwUI GKwU †gŠwjK m~Î| GKwU wbDUªb ÿq n‡j ÿq nIqv As‡kI Gi N~Y©b AweK…Z \_vK‡e| B‡jKUªb Avi †cÖvUb hw` GKB w`‡K †Nv‡i, Z‡e Zv‡`i N~Y©‡bi †hvMdj n‡e wbDUª‡bi N~Y©‡bi wØ¸Y| Z‡e Zviv hw` wfbœ w`‡K †Nv‡i, †m‡ÿ‡Î †hvMdj n‡e k~b¨| NUbv hvB †nvK, GKwU †cÖvUb ev GKwU B‡jKUªb GKv wbDUª‡bi mgvb n‡Z cv‡i bv| wKš‘ wbDwUª‡bvi K\_v wnmv‡e ai‡j fvimvg¨ nq| ïay a‡i wb‡Z n‡e wbDwUª‡bvi N~Y©‡bi gvÎvI Ab¨‡`i g‡Zv| †m‡ÿ‡Î ÿqK…Z wZbwU As‡ki `y‡Uv Nyi‡e GKB w`‡K, Avi Z…ZxqwU D‡ëvw`‡K|

d‡j wbDwUª‡bv kbv³ nevi Av‡MB c`v\_©we`iv ey‡S †dj‡jb, GB KYvi ˆe`y¨wZK PvR© \_vK‡e bv| Nyi‡e B‡jKUª‡bi g‡Zv GKB w`‡K| fi \_vK‡e bv ev \_vK‡jI †mUv n‡e ¯^í cwigvY| mvaviY e¯‘i mv‡\_ wg\_w¯Œqv Ki‡e GZB `ye©jfv‡e †h Zvi †Kv‡bv jÿYB †Pv‡L co‡e bv| GK K\_vq, GwU GK ai‡bi NyišÍ f~Z| d‡j GUv LyeB ¯^vfvweK †h cvDwji Abygv‡bi c‡i cixÿvMv‡i Gi Aw¯ÍZ¡ wbwðZ K‡i cÖgvY Ki‡Z cÖvq wek eQi †j‡M †M‡Q| eZ©gv‡b wbDK¬xq Pzwjø‡Z Giv msL¨vq msL¨vq ˆZwi nq| d‡j jyKv‡bv ¯^fv‡ei n‡jI gv‡Sgv‡SB G‡`i‡K kbv³ K‡i †djv hvq|

GKB mv‡\_ KvwgIKv Lwb‡Z wbDwUª‡bvi nvbv Ges 1987G mycvi‡bvfvi Avwefv©e †Kvb g‡ZB KvKZvjxq NUbv wQj bv| weÁvbx‡`i g‡Z `y‡Uv NUbv GKB mv‡\_ NUvi g‡a¨ mycvi‡bvfv Z‡Ë¡i cÖgvY i‡q‡Q| GZ w`b a‡i †R¨vwZwe©Ávbxiv †Zv mycvi‡bvfv †\_‡KB GK SvuK wbDwUª‡bv Avmvi cÖZ¨vkv KiwQ‡jb|

jvwZb fvlvq †bvfv gv‡b bZzb| Z‡e 1987G bv‡gi mycvi‡bvfvwU bZzb †Kv‡bv bÿ‡Îi Rb¥ wQj bv| GwU Avm‡j wQj e„nr we‡ùvi‡Yi gva¨‡g cyivZb GK bÿ‡Îi g„Zz¨| mycvi‡YvfvwUi Drm jvR© g¨v‡RjvwbK K¬vDW GKwU ÿz`ª Qvqvc\_| `~iZ¡ 1 jÿ 70 nvRvi Av‡jvKel©| GwU Avgv‡`i wgwéI‡q Qvqvc‡\_i GZUvB Kv‡Q †h GwU A‡bKUv wgwéI‡qi DcQvqvc\_ (satellite gallaxy)| `wÿY †Mvjva© †\_‡K G‡K Lvwj †Pv‡LI †`Lv hvq| †Qvc †Qvc Av‡jvi GKwU `vM| bÿÎ¸‡jv‡K Avjv`v K‡i †`L‡Z n‡j PvB eo †Uwj‡¯‹vc| †kë‡bi Avwe®‹v‡ii K‡qK NÈvi g‡a¨B A‡÷ªjxq †R¨vwZwe©`iv †R‡b †dj‡jb, jvR© g¨v‡RjvwbK K¬vD‡Wi K‡qK k †KvwU bÿ‡Îi g‡a¨ †KvbwU G we‡ùviY NwU‡q‡Q| GUv Kivi R‡b¨ Zvuiv AvKv‡ki H As‡ki Av‡Mi wKQz d‡UvMÖvwdK †cøU e¨envi K‡ib| bÿÎwU wQj we3 mycviRvqv›U †kÖwYi1| GwU m~‡h©i Zzjbvq PIov wQj 40 ¸Y| bvgI Av‡Q GKwU| m¨vÛzwjK-69 202 (Sanduleak -69 202)|

bÿ‡Îi we‡ùviY NU‡Z cv‡i, GB welq wb‡q cÖ\_g M‡elYv Pvjvb †R¨vwZ©c`v\_©we` †d«W n‡qj, DBwjqvg dzjvi Ges †Rwd« I gviMv‡iU eviweR| GUv 1950 Gi `k‡Ki gvSvgvwSi K\_v| Ggb DËvj `kvq bÿÎiv Kx K‡i Av‡m Zv Rvb‡Z n‡j eyS‡Z n‡e G‡`i †fZ‡i Pjv cÖwµqv¸‡jv| Avgv‡`i me‡P‡q †PbvRvbv bÿÎ n‡jv m~h©| Ab¨ bÿ‡Îi g‡ZvB †`‡L g‡b n‡”Q m~‡h© †Kv‡bv cwieZ©b †bB| Avm‡j wKš‘ m~h© cÖwZwbqZ g„Zz¨i mv‡\_ msMÖvg K‡i hv‡”Q| me bÿÎB M¨vm w`‡q ˆZwi| GB M¨vm hy³ \_v‡K gnvK‡l©i Kvi‡Y| Z‡e hy×‡ÿ‡Î gnvKl© GKv \_vK‡j bÿÎwU wb‡Ri Zxeª AvKl©‡Y wb‡g‡li g‡a¨ ¸wU‡q †hZ| DavI n‡q †hZ K‡qK NÈvi g‡a¨| wKš‘ †mUv nq bv| KviY †fZ‡ii w`‡Ki GB e‡ji wecix‡Z evB‡ii w`‡K KvR K‡i Av‡iKwU ej| bÿ‡Îi Af¨šÍ‡ii m¼zwPZ M¨v‡mi ewngy©Lx Pvc| `y‡Uv‡Z ˆZwi nq fvimvg¨|

M¨v‡mi Pvc I ZvcgvÎvi g‡a¨ GKwU mij m¤úK© Av‡Q| mvaviYZ GKwU wbw`©ó AvqZ‡bi M¨vm‡K DËß Ki‡j ZvcgvÎvi Abycv‡Z Gi Pvc ev‡o| Avevi ZvcgvÎv Kg‡j K‡g hvq PvcI| bÿ‡Îi †fZ‡i Zxeª Pv‡ci KviY Gi Zxeª ZvcgvÎv| eû wgwjqb wWwMÖ †mjwmqvm| GB Zv‡ci Drm n‡jv wbDK¬xq wewµqv| bÿ‡Îi Rxe‡bi †ewkifvM mgq Ry‡o GKwU wewµqvB P‡j| †mUv n‡jv wdDkb (ms‡hvRb) wewµqvi gva¨‡g nvB‡Wªv‡Rb‡K wnwjqv‡g iƒcvšÍi| cigvYy¸‡jvi wbDwK¬qv‡mi B‡jKUªbiv ci¯úi‡K weKl©Y K‡i| d‡j GB weKl©Y‡K civf~Z Ki‡Z wewµqvi ZvcgvÎv n‡Z nq cÖPÐ| wdDk‡bi kw³ GKwU bÿÎ‡K K‡qK k †KvwU eQi wUwK‡q ivL‡Z cv‡i| wKš‘ GK w`b bv GK w`b R¦vjvwb wVKB dzwi‡q Av‡m| `ye©j n‡q c‡o wewµqvi MwZ| Gevi ewngy©Lx Pvc `ye©j n‡q c‡o| wR‡Z hvq gnvKl©| bÿÎwU Zvi Aewkó R¦vjvwb w`‡q gnvKl©RwbZ AšÍ:‡ùvUb (†fZ‡ii w`‡K ¸wU‡q hvIqv) cÖwZnZ K‡i Av‡iKUz mgq †eu‡P \_v‡K| wKš‘ c„ô †\_‡K cÖwZevi gnvk~‡b¨ kw³ wbwÿß nevi mv‡\_ mv‡\_ AwšÍg mgq `ªæZ Nwb‡q Avm‡Z \_v‡K|

wnmve K‡i †`Lv †M‡Q, †h cwigvY nvB‡Wªv‡Rb wb‡q m~‡h©i c\_ Pjv ïiæ n‡q‡Q Zv‡Z Zvi cÖvq GK nvRvi †KvwU eQi R¦jvi K\_v| GLb eqm cvuP k †KvwU eQi| gv‡b cÖvq A‡a©K R¦vjvwb †kl| (GLbI f‡qi wKQz †bB) GKwU bÿÎ Kx nv‡i wbDK¬xq R¦vjvwb LiP Ki‡e Zv wbf©i K‡i Gi f‡ii Ici| fvix bÿÎiv R¦vjvwb LiP K‡i A‡bK `ªæZ| Zv bv K‡i †h Dcvq †bB| Giv eo Ges D¾¡j| d‡j wewKiY K‡i †ewk cwigvY kw³| evowZ IR‡bi Kvi‡Y M¨v‡mi NbZ¡ I ZvcgvÎv hvq †e‡o| d‡j †e‡o hvq wdDk‡bi nvi| †hgb 10 †mŠi f‡ii GKwU bÿÎ Gi †ewkifvM nvB‡Wªv‡Rb gvÎ GK †KvwU eQ‡iB †kl K‡i †dj‡Z cv‡i|

Ggb fvix GKwU bÿ‡Îi fwel¨r †Kgb n‡Z cv‡i †`Lv hvK| †ewkifvM bÿ‡Îi Rxeb ïiæ nq g~jZ nvB‡Wªv‡Rb w`‡q| nvB‡Wªv‡Rb wbDwK¬qvm gv‡b †Kej GKwU †cÖvUb| nvB‡Wªv‡R‡bi Ô`nbÕ2 cÖwµqvq `y‡Uv nvB‡Wªv‡Rb wbDwK¬qvm hy³ n‡q wnwjqvg †gŠ‡ji wbDwK¬qvm MwVZ nq| Gi cÖwZwU‡Z \_v‡K `ywU K‡i †cÖvUb I wbDUªb| (Gi we¯ÍvwiZ e¨vL¨v GKUz RwUj Avi †mUv Avgv‡`i AvcvZZ `iKviI †bB) wbDK¬xq kw³i m‡e‡Pq Kvh©Kix Drm n‡jv nvB‡Wªv‡Rb Õ`nbÕ| Z‡e GUvB GKgvÎ Drm bq| Af¨šÍifv‡Mi ZvcgvÎv h‡\_ó †ewk n‡j wnwjqvg wbDwK¬qvm hy³ n‡q Kve©b MVb Ki‡Z cv‡i| ZviI c‡i wdDk‡bi gva¨‡g Aw·‡Rb, wbIb I Ab¨vb¨ †gŠj ˆZwi nq| G‡Ki ci GK wbDK¬xq wewµqv Pvwj‡q hvIqvi g‡Zv cÖ‡qvRbxq Af¨šÍixY ZvcgvÎv Drcbœ Kivi KvR fvix bÿÎiv Ki‡Z cv‡i| gv‡S gv‡S †m ZvcgvÎv GKk †KvwUi Ic‡iI nq|

wKš‘ kw³ ax‡i ax‡i Kg‡Z \_v‡K| cÖwZwU bZzb †gŠj ˆZwii mv‡\_ mv‡\_ wbM©Z kw³i cwigvY n«vm †c‡Z \_v‡K| R¦vjvwb `ªæZ †\_‡K `ªæZZi LiP n‡Z \_v‡K| bÿ‡Îi Dcv`vb e`‡j †h‡Z \_v‡K| ïiæ‡Z cÖwZ gv‡m, c‡i cÖwZ w`b Ges †kl‡gl cÖwZ NÈvq| Af¨šÍifvM `vuovq †cuqv‡Ri g‡Zv| GLv‡b ¯Íi¸‡jv n‡j DËvj cÖwµhvq µ‡g µ‡g M‡o IVv ivmvqwbK †gŠj¸‡jv| evB‡ii w`‡K Avevi bÿÎwU dz‡j-‡du‡c eo n‡q hvq| n‡q hvq Avgv‡`i cy‡iv †mŠiRM‡Zi †P‡qI eo| G‡KB †R¨vwZwe©`iv e‡jb †jvwnZ AwZ`vbe (red supergiant)|

wbDK¬xq `nb cÖwµqvi BwZ N‡U †jvnv ˆZwii gva¨‡g| Gi wbDK¬xq MVbUv †ek w¯’wZkxj| wbDK¬xq wdDk‡bi gva¨‡g †jvnvi †P‡q fvix †gŠj MwVZ n‡Z bÿ‡Îi wb‡RiB kw³ avi Ki‡Z nq| wbM©Z Kiv †Zv c‡ii K\_v| d‡j †jvnv ˆZwi n‡q †M‡Q gv‡b GKwU bÿ‡Îi GLv‡bB mgvwß| †K›`ªxq AÂj hLb Avi Zvc Drcœb Ki‡Z bv cvi‡e, `vevi ¸wU P‡j hv‡e gnvK‡l©i nv‡Z| bÿÎwU n‡q Pigfv‡e fvimvg¨nxb| cwZZ nq wbR¯^ gnvKlx©q M‡Z©|

c‡ii NUbv Lye `ªyZ N‡U| bÿ‡Îi †jvnvq Mov †K›`ª wbDK¬xq `n‡bi gva¨‡g Avi †Kv‡bv Zvc Drcv`b Ki‡Z cv‡i bv| d‡j a‡i ivL‡Z e¨\_© nq wb‡Ri IRb| GZ `ªæZ ¸wU‡q hvq †h cigvYy¸‡jv ch©šÍ `yg‡o-gyP‡o hvq| †kl ch©šÍ †K‡›`ªi NbZ¡ GZ †e‡o hvq †h GKwU Av½y‡ji gv\_vq †h cwigvY c`v\_© AvuU‡e †mUvB cÖvq GK jÿ †KvwU Ub| G `kvq bÿÎwUi †K›`ªgÐ‡ji e¨vm nq gvÎ `yB k wK‡jvwgUvi| wbDK¬xq c`v‡\_©i KvwV‡b¨i d‡j GwU jvdvjvwd Ki‡e| gnvKl© GZ kw³kvjx †h GB wekvj NUbv NU‡Z mgq jvM‡e K‡qK wgwj‡m‡KÛ| †K‡›`ª †hb bvU‡Ki †Kv‡bv †kl †bB| AvKw¯§Kfv‡e Zxeª Av‡jvo‡bi gva¨‡g bvÿwÎK c`v‡\_©i Avkcv‡ki ¯Íi¸‡jv G‡m cwZZ nq †K›`ªgÐ‡j| †m‡K‡Û AhyZ AhyZ †e‡M P‡j †fZ‡ii w`‡Ki GB MwZ| wUªwjqb wUªwjqb3 c`v\_© G‡m AvNvZ nv‡b Zxeª Nb †K›`ªgÐ‡j| †K›`ªgÐj nq nxivi †`qv‡ji †P‡qI `„p| Gici nq Zxeª msNl©| hvi d‡j evB‡ii w`‡K Qwo‡q c‡o GKwU kw³kvjx kK I‡qf|

kK I‡q‡fi mv‡\_ mv‡\_ wecyj cwigvY wbDwUª‡bvI wbM©Z nq| bÿ‡Îi me©‡kl wbDK¬xq iƒcvšÍ‡ii mgq †fZ‡ii GjvKv †\_‡K AvKw¯§Kfv‡e †ei nq KYv¸‡jv| GB iƒcvšÍ‡ii cÖv°v‡jB bÿ‡Îi cigvYyi B‡jKUªb I †cÖvUb wgwjZ n‡q MVb K‡i wbDUªb| d‡j bÿ‡Îi †K›`ªgÐj wbDUª‡bi GK wekvj †Mvj‡K cwiYZ nq| kK I‡qf I wbDwUª‡bviv †hŠ\_fv‡e bÿ‡Îi evB‡ii ¯Íi¸‡jvi w`‡K wecyj cwigvY kw³ cwienb K‡i| GB kw³ †kvlY K‡i bÿ‡Îi evB‡ii ¯Íi we‡ùvwiZ nq| GK fqven wbDK¬xq we‡ùviY| K‡qK w`b hveZ bÿÎwU nvRvi †KvwU m~‡h©i Av‡jv wewKiY K‡i| K‡qK mßvn ci Avevi ax‡i ax‡i wb®úÖf n‡q †h‡Z \_v‡K|

wgwéI‡qi g‡Zv Av`k© M¨vjvw·¸‡jv‡Z cÖwZ kZvãx‡Z `yB wK wZbwU mycvi‡bvfv †`Lv hvq| †R¨vwZwe©`iv we¯§q †Pv‡L †m¸‡jv bw\_e× K‡i‡Qb| Gi g‡a¨ weL¨vZ GKwU †`Lv wM‡qwQj 1054 mv‡j| Pxbv I Avie †R¨vwZwe©`iv GwU ch©‡eÿY K‡ib| Ae¯’vb wQj AvKv‡ki KK©U gÐjx‡Z| we`xY© †mB ZviKvwU‡K AvR cÖmviYkxj M¨v‡mi †Quov †g‡Ni g‡Zv jv‡M| bvg µ¨ve †beyjv ev KvuKov bxnvwiKv|

1987G mycvi‡bvfvi we‡ùvi‡Yi gva¨‡g gnvwe‡k^ eû A`„k¨ wbDwUª‡bv Qwo‡q c‡o| GB wbtmi‡Yi ZxeªZv wQj gvivZ¥K| c„w\_exi cÖwZ eM© †mw›UwgUvi RvqMvq GK AhyZ †KvwU wbDwUª‡bv AvNvZ nv‡b| hw`I we‡ùviY¯’j †\_‡K c„w\_exi `~iZ¡ 1 jÿ 70 nvRvi Av‡jvKel©| c„w\_exi gvbyl GB LeiUv Rvb‡ZI cv‡iwb †h Ab¨ GKwU Qvqvc\_ †\_‡K Avmv eû wUªwjqb KYv Zv‡`i kixi †f` K‡i P‡j †M‡Q| wKš‘ KvwgIKv I InvB‡qv †cÖvUb-ÿq wW‡U±i¸‡jv 19 wU wbDwUª‡bv‡K a‡i †d‡j| GB e¨e¯’v bv \_vK‡j wbDwUª‡bv¸‡jv mevi ARv‡šÍ P‡j †hZ| †hgbwU wM‡qwQj 1054 mv‡j|

mycvi‡bvfv gv‡bB GKwU bÿ‡Îi g„Zz¨| Z‡e we‡ùvi‡Yi GKwU fv‡jv w`KI Av‡Q| wecyj cwigvY kw³ Aegy³ nevi d‡j bÿ‡Îi evB‡ii ¯Íi¸‡jv DËß n‡q I‡V| DËvc GZ †ewk nq †h wKQz mg‡qi R‡b¨ AveviI wbDK¬xq wdDkb wewµqv n‡Z cv‡i| G wewµqv kw³ wbM©Z Kivi e`‡j †kvlY K‡i| me‡P‡q DËvj GB bvÿwÎK Pzwjø‡ZB †jvnvi †P‡q fvix †gŠj¸‡jv cÖ¯‘Z nq| GB †hgb, †mvbv, wmmv, BD‡iwbqvg BZ¨vw`| Kve©b, Aw·‡R‡bi g‡Zv wbDK¬xq ms‡kø‡li cÖv\_wgK ch©v‡q ˆZwi nvjKv †gŠj¸‡jvi mv‡\_ mv‡\_ GB fvix †gŠj¸‡jvI gnvKv‡k wbwÿß nq| wg‡k hvq Ab¨ mycvi‡bvfv‡`i wbwÿß Ggb AmsL¨ c`v‡\_©i mv‡\_| cieZx© mg‡q GB fvix c`v\_©¸‡jv bZzb cÖR‡b¥i bÿÎ I MÖ‡n cwiYZ nq| GB †gŠj¸‡jv cÖ¯‘Z ev wbwÿß bv n‡j c„w\_exi g‡Zv †Kv‡bv MÖn ˆZwi nZ bv| cÖvY ˆZwii KvuPvgvj Kve©b I Aw·‡Rb, e¨vs‡K iwÿZ †mvbv, Qv‡`i wmmvi Av¯Íi, wbDK¬xq Pzwjø‡Z BD‡iwbqv‡gi iW—c„w\_exi GB me wKQz n‡q‡Q bÿÎ‡`i Rxe‡bi wewbg‡q| Avgv‡`i m~‡h©i R‡b¥i Av‡MB hv‡`i Rxe‡bi BwZ N‡UwQj| fve‡ZB †Kgb jv‡M, Avgv‡`i kixi †h Dcv`vb w`‡q ˆZwi Zv eû Kvj a‡i g„Z bÿ‡Îi wbDK¬xq QvB w`‡q Mov|

mycvi‡bvfv we‡ùvi‡Y bÿÎ m¤ú~Y© †kl n‡q hvq bv| Zzgyj D‡ËRbvi ga¨ w`‡q †ewkifvM c`v\_© †ewi‡q †M‡jI m¼zwPZ †h †Kvi ev †K›`ªgÐj H NUbvi m~ÎcvZ K‡iwQj, †mwU †\_‡K hvq wb‡Ri Ae¯’v‡bB| Z‡e Gi wbqwZI †h Kx n‡e †mUv wbw`©ó K‡i ejv m¤¢e bq| †Kv‡ii fi hw` Lye Kg nq, GB aiæb GK †mŠi fi, Zvn‡j GwU †QvU kn‡ii mvB‡Ri GKwU wbDUª‡bi †Mvj‡K cwiYZ n‡e| Lye m¤¢e GB wbDUªb bÿÎwU Db¥Ëfv‡e Nyi‡Z \_vK‡e| m¤¢eZ cÖwZ †m‡K‡Û 1000 evi| gv‡b Gi c„‡ô NyY©b †eM n‡e Av‡jvi †e‡Mi 10 kZvsk| Gi KviY n‡jv m‡¼vPb| hvi d‡j Aí N~Y©b wb‡q ïiæ nIqv bÿÎwUI †Rv‡i Nyi‡Z \_v‡K| ei‡di Ici †‡¯‹wUs Kiv Ae¯’vq nvZ ¸wU‡q wb‡jI wVK GKB Kvi‡Y A‡cÿvK…Z †Rv‡i Nyiv hvq| Gfv‡e †Rv‡i AveZ©bkxj eû wbDUªb bÿÎ †R¨vwZwe©`iv Lyu‡R †c‡q‡Qb| wKš‘ AveZ©b ax‡i ax‡i K‡g Av‡m| KviY, e¯‘wU kw³ nviv‡Z \_v‡K| †hgb KvuKov bxnvwiKvi ga¨Lv‡b Aew¯’Z wbDUªb bÿÎwU GLb †m‡K‡Û gvÎ 33 evi Ny‡i|

Z‡e †Kv‡ii fi hw` Av‡iKUz †ewk nq, GB aiæb K‡qK †mŠi fi, Zvn‡j GwU wbDUªb n‡qB nvZ ¸wU‡q e‡m \_vK‡Z cv‡i bv| gnvKl© G‡ÿ‡Î A‡bK kw³kvjx| wbDUªb w`‡q Mov e¯‘ eZ©gv‡b Rvbv me‡P‡q `„p e¯‘| wKš‘ GB wbDUªbI evowZ m‡¼vPb †VKv‡Z cv‡i bv| NUbv Mov‡Z \_v‡K AviI `viæY cwiYwZi w`‡K| mycvi‡bvfvi †P‡qI DËvj| bÿ‡Îi †Kvi ¸wU‡q †h‡ZB \_v‡K| GK wgwj‡m‡KÛ GiI Kg mg‡q GwU GKwU eø¨vK †nvj ev K…òMnŸi evwb‡q †d‡j| nvwi‡q hvq `„k¨gvb RMr †\_‡K|

Zvi gv‡b, fvix bÿÎ‡`i wbqwZ n‡jv wQbœwewQbœ n‡q hvIqv| Avi aŸsmve‡kl wn‡m‡e †\_‡K hvq GKwU wbDUªb bÿÎ ev GKwU eø¨vK †nvj| Pvicv‡k Qwo‡q wQwU‡q \_v‡K wbwÿß M¨v‡mi `j| †K Rv‡b KZ KZ bÿÎ GLY ch©šÍ GB cwiYwZ eiY K‡i‡Q| wKš‘ ïay wgwéI‡q M¨vjvw·‡ZB Ggb wewjqb wewjqb bvÿwÎK aŸsmve‡kl c‡o \_vK‡Z cv‡i|

†QvU †ejvq Avwg Lye fq †cZvg †h m~h© nqZ we‡ùvwiZ n‡q †h‡Z cv‡i| Avm‡j wKš‘ f‡qi wKQz †bB| GwU KLbI mycvi‡bvfv n‡e bv| Gi fi AZ †ewk bq| fvix bÿ‡Îi Zzjbvq nvjKv¸‡jvi wbqwZ GZ DËvj bq| cÖ\_g K\_v n‡jv, G‡ÿ‡Î wbDK¬xq cÖwµqvq R¦vjvwb e¨q nq A‡bK Kg MwZ‡Z| b~¨bZg bvÿwÎK f‡ii GKwU evgb bÿÎ GK wUªwjqb eQi hveZ GKB nv‡i Av‡jv w`‡q †h‡Z \_vK‡Z cv‡i| Zvi Ici GKwU nvjKv bÿ‡Îi Af¨šÍixY ZvcgvÎv GZ †ewk nIqv m¤¢e bq †h GwU †jvnvI ms‡køl Ki‡e| d‡j G‡Z DËvj AšÍt‡ùvUb NU‡Z cv‡i bv|

m~h© ¯^í f‡ii bÿ‡Îi GKwU Av`k© D`vniY| nvB‡Wªv‡Rb R¦vjvwb LiP I wnwjqv‡g iƒcvšÍi n‡”Q Lye ax‡imy‡¯’| wnwjqvg g~jZ \_v‡K †K›`ªxq †Kv‡ii w`‡K| wbDK¬xq wewµqvi K\_v ej‡j †Kvi‡K wbw®ŒqB ej‡Z n‡e| wdDkb msNwUZ nq †Kv‡ii c„‡ô| d‡j gnvKlx©q e‡ji m‡¼vPb †iva Kivi R‡b¨ m~‡h©i †h ciwgvY Zvc cÖ‡qvRb †Kvi Zv ˆZwi‡Z †Kv‡bv f~wgKv ivL‡Z cv‡i bv| m‡¼vPb †VKv‡Z bZzb nvB‡Wªv‡R‡bi mÜv‡b m~h©‡K Gi wbDK¬xq Kg©KvÐ evB‡ii w`‡K Qwo‡q w`‡Z nq| Gw`‡K wnwjqvg †Kvi µ‡gB †QvU n‡Z \_v‡K| Af¨šÍixY Gme cwieZ©‡bi d‡j mg‡qi mv‡\_ mv‡\_ m~‡h©i †Pnviv µgk e`‡j hv‡e| GwU dy‡j-‡du‡c DV‡e| wKš‘ c„ô wKwÂZ VvÐv n‡e| †`Lv hv‡e nvjKv jvj Avfv| G Ae¯’v Pj‡Z \_vK‡e hZ w`b bv m~h© †jvwnZ `vb‡e (red giant) cwiYZ nq| G mgq m¤¢eZ GwU eZ©gvb mg‡qi cvuP k ¸Y eo n‡e| †R¨vwZwe©`‡`i Kv‡Q †jvwnZ `vbe GKwU cwiwPZ bvg| AvKv‡ki †ek KwU cwiwPZ D¾¡j bÿÎB GB †kÖwYi bÿÎ| †hgb, Avj`v‡eivb (Aldebaran), Av`ªv (Betelgeuse) I ¯^vZx (Arcturus)| ¯^í f‡ii bÿÎ‡`i mgvwßi ïiæ nq †jvwnZ `vbe `kvi gva¨‡g|

†jvwnZ `vbeiv A‡cÿvK…Z kxZj nq| Z‡e mvBR eo nevi Kvi‡Y G‡`i wewKiY c„ô nq wekvj| Zvi gv‡b mvwe©K `xwß ev (luminosity) J¾¡j¨I †ewk| G mgq Kcvj cyo‡e m~‡h©i MÖn¸‡jvi| AviI cÖvq Pvi k †KvwU eQi ci ewa©Z Zvc cÖevn AvNvZ nvb‡e G‡`i Ici| Zvi A‡bK Av‡MB c„w\_ex emevv‡mi A‡hvM¨ n‡q hv‡e| mvMi ïwK‡q hv‡e Avi D‡o hv‡e evqygÐj| Gici m~h© AviI we¯Í…Z n‡e| MÖvm Ki‡e eya MÖn‡K| Zvici ïµ| cwi‡k‡l c„w\_ex‡KI wb‡q wb‡e AvMÖvmx †c‡Ui †fZi| Avgv‡`i MÖnLvwb cwiYZ n‡e A½v‡i| GZ `nb mn¨ K‡iI wKš‘ hv‡e bv Kÿc\_ †Q‡o| m~‡h©i jvj-Dò M¨v‡mi NbZ¡ GZ K‡g hv‡e †h †mUv k~b¨ ¯’v‡bi KvQvKvwQ n‡e| d‡j c„w\_exi MwZ n‡e cÖvq gm„Y|

Gnvwe‡k^ Avgv‡`i Aw¯Í‡Z¡i KviY m~‡h©i g‡Zv Ggb AmvaviY w¯’wZkxj bÿÎ| †hwU K‡qK wewjqb eQi a‡i AweiZ R¦j‡Z cv‡i| †h mgqUv Rxe‡bi ¯ú›`b ˆZwi I weKv‡ki R‡b¨ h‡\_ó| wKš‘ †jvwnZ `vbe `kvq GB w¯’wZkxjZvi BwZ NU‡e| m~‡h©i g‡Zv bÿ‡Îi Rxe‡bi c‡ii avc¸‡jv RwUj, Awbw`©ó I DËvj| nVvr K‡i e`‡j hvq AvPiY I †Pnviv| eq¯‹ bÿÎiv ¯úw›`Z n‡Z n‡Z ev M¨v‡mi †Lvjm Qvov‡Z Qvov‡Z wbhyZ wbhyZ eQi cvi K‡i w`‡Z cv‡i| bÿ‡Îi †Kv‡ii wnwjqvg `nb msNwUZ K‡i Kve©b, bvB‡Uªv‡Rb, Aw·‡Rb ˆZwi Ki‡Z cv‡i| d‡j bÿÎwU AviI wKQz w`b †e‡uP hvevi R‡b¨ cÖ‡qvRbxq kw³ †c‡q hvq| evB‡ii ¯ÍiwU‡K gnvk~‡b¨ wb‡ÿc Kivi c‡i bÿÎwUi Kv‡Q Kve©b-Aw·‡R‡b Mov †Kvi Qvov Avi wKQz \_v‡K bv|

RwUj Kvh©µ‡gi GB hyM †kl n‡j ¯^í I gvSvwi f‡ii bÿÎiv †kl ch©šÍ gnvK‡l©i Kv‡Q AvZ¥mgc©Y K‡i| nq m¼zwPZ| GB m‡¼vPb KviI K\_v gv‡b bv| †kl ch©šÍ bÿ‡Îi mvBR MÖ‡ni mgvb K‡i Z‡e Qv‡o| G Ae¯’vq e¯‘wU‡K †R¨vwZwe©`iv e‡jb †k^Z evgb (white dwarf)| mvBR †QvU nevi Kvi‡Y †k^Z evgbiv Lye Aby¾¡jI| hw`I Zv‡`i c„ô ZvcgvÎv n‡Z cv‡i m~‡h©i †P‡qI †ewk| †Kv‡bvwU‡KB †Uwj‡¯‹vc Qvov c„w\_ex †\_‡K †`Lv hvq bv|

`~i fwel¨‡Z †k¦Z evg‡b cwiYZ nIqvUvB †jLv Av‡Q Avgv‡`i fv‡M¨| G Ae¯’vq †cŠuQvi ci eû wewjqb eQi a‡i DËß \_vK‡e m~h©| Gi wekvj Aeqe GZ k³ n‡e †h GwU Gi Af¨šÍixY Zvc Lye `ÿZvi mv‡\_ AvU‡K ivL‡e| Avgv‡`i Rvbv †miv Zvc †iva‡Ki †P‡qI fv‡jvfv‡e| wKš‘ †fZ‡ii wbDK¬xq Pzwjø‡Z †h‡nZz wPiw`‡bi R‡b¨ jvjevwZ R¦‡j †M‡Q, ZvB †fZ‡i Avi †Kv‡bv evowZ R¦vjvwb Aewkó †bB| d‡j ZviKvwU †\_‡K ax‡i ax‡i kxZj gnvk~‡b¨i Mfx‡ii w`‡K †h Zvcxq wewKiY wbM©Z n‡”Q †mUv c~iY Kiv m¤¢e bq| Lye ax‡i evgb aŸsmve‡klwU kxZj I Aby¾¦j n‡q hv‡e| hw`I GK mgq Zv wQj Avgv‡`i †ZR¯^x m~h©| Avi GKwU cwieZ©b evwK| Gevi GwU µgk GKwU KwVb ùwU‡K (crystal) cwiYZ n‡e| `„pZv n‡e Amvgvb¨| †k‡l GwU G‡Kev‡iB wbt‡kl n‡q hv‡e| wbi‡e wg‡k hv‡e gnvk~‡b¨i AÜKv‡i|

Abyev`‡Ki †bvU:

1. ZvcgvÎvi wfwË‡Z bÿ‡Îi †kÖwYwefv‡M O, B, A, F, G, K I M eY©¸‡jv e¨envi Kiv nq| G µgvbymv‡i O †kÖwYi bÿÎ me‡P‡q Dò| Avi M †kÖwYi bÿÎ me‡P‡q Kg Dò|
2. mvaviY A‡\_© `nb ej‡Z †evSvq †Kv‡bv †gŠ‡ji mv‡Z Aw·‡R‡b wewµqv| Z‡e †mUv n‡jv GZ ai‡bi ivmvqwbK wewµqv| GLv‡b K\_v n‡”Q wbDK¬xq wewµqv wb‡q| ivmvqwbK wewµqvq bZzb †Kv‡bv †gŠj Drcbœ n‡Z cv‡i bv| wKš‘ wbDK¬xq wewµqvq nq G KvRwUB|
3. GK wUªwjqb mgvb GK jÿ †KvwU, gv‡b 1,000,000,000,000|