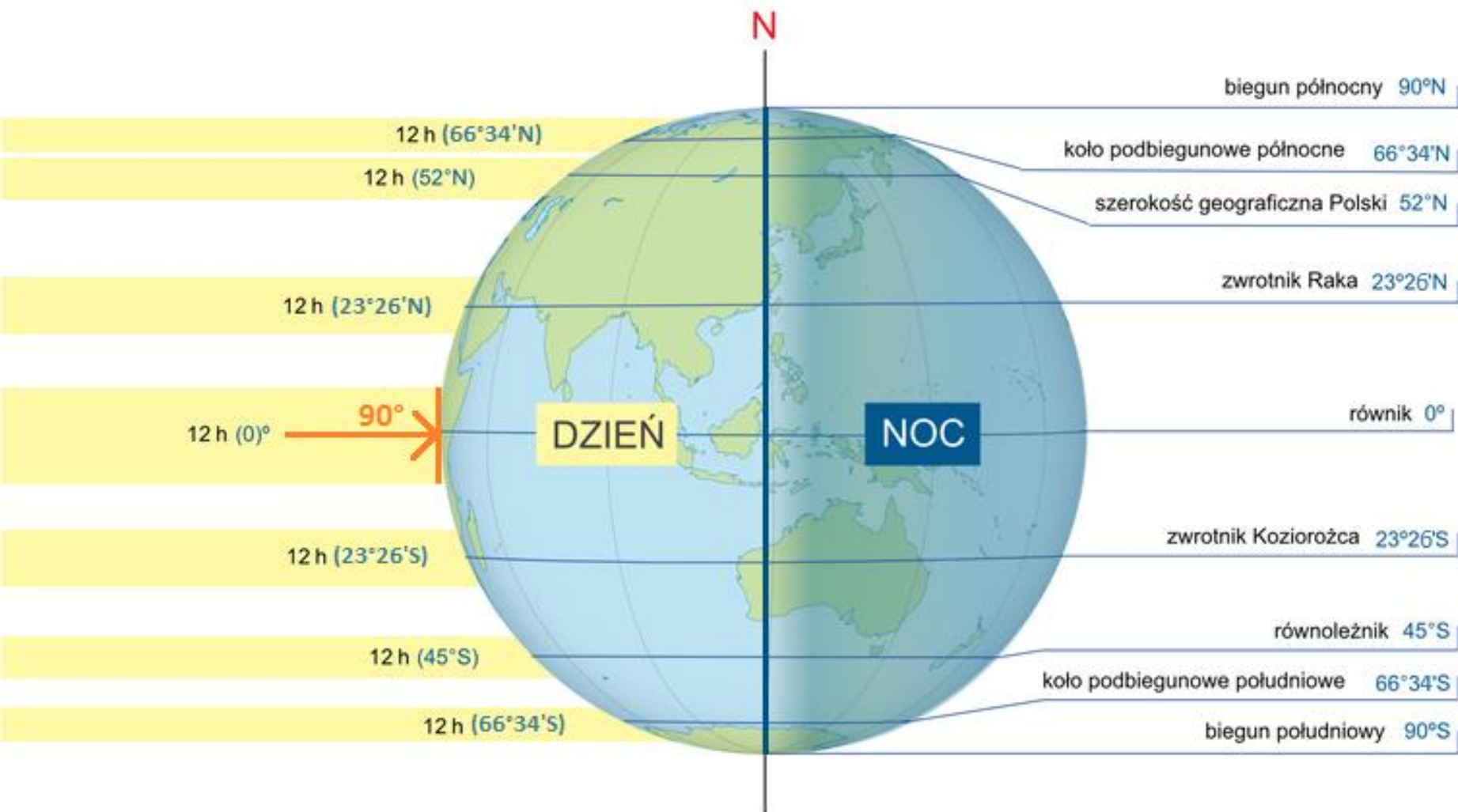
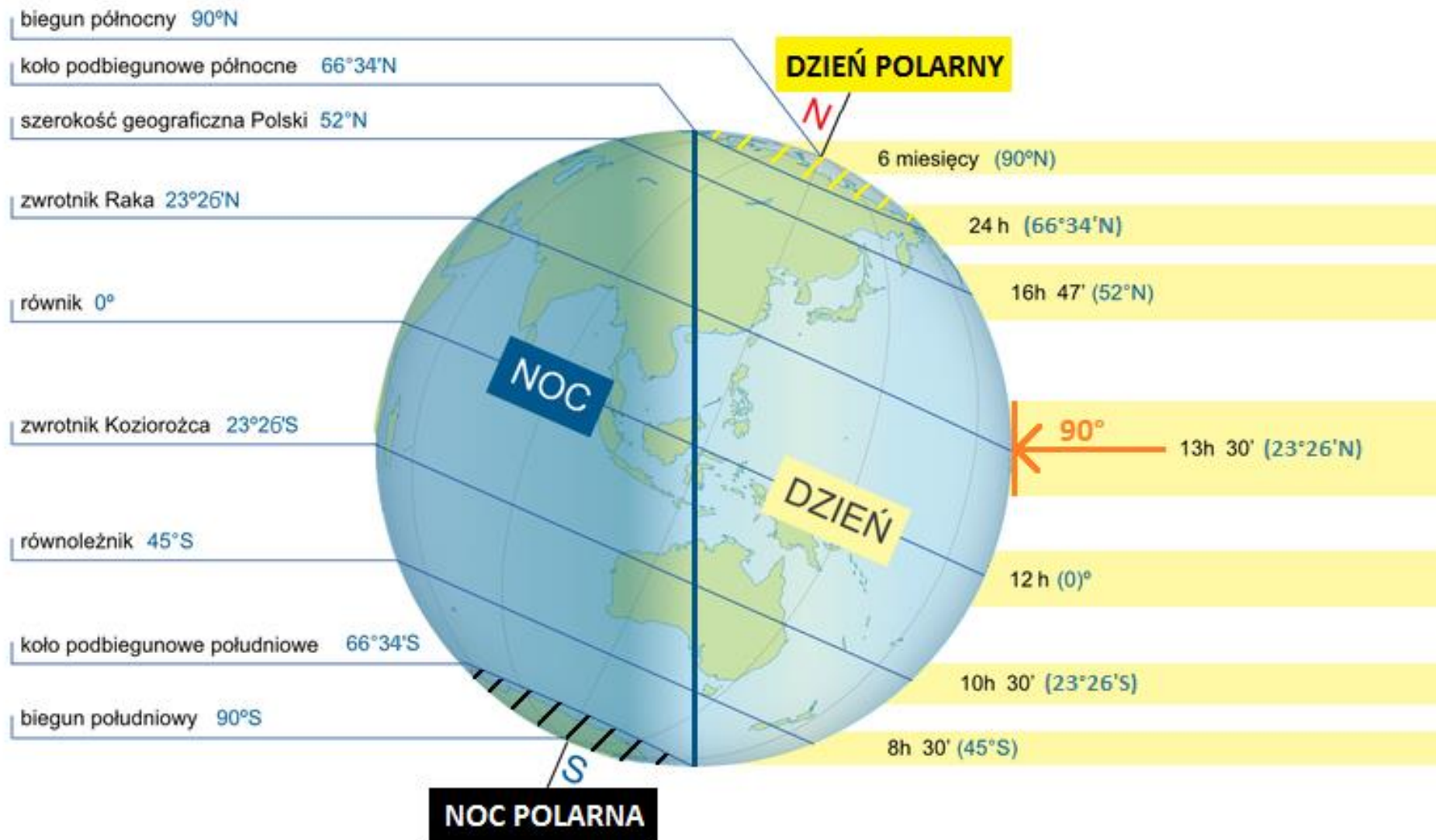


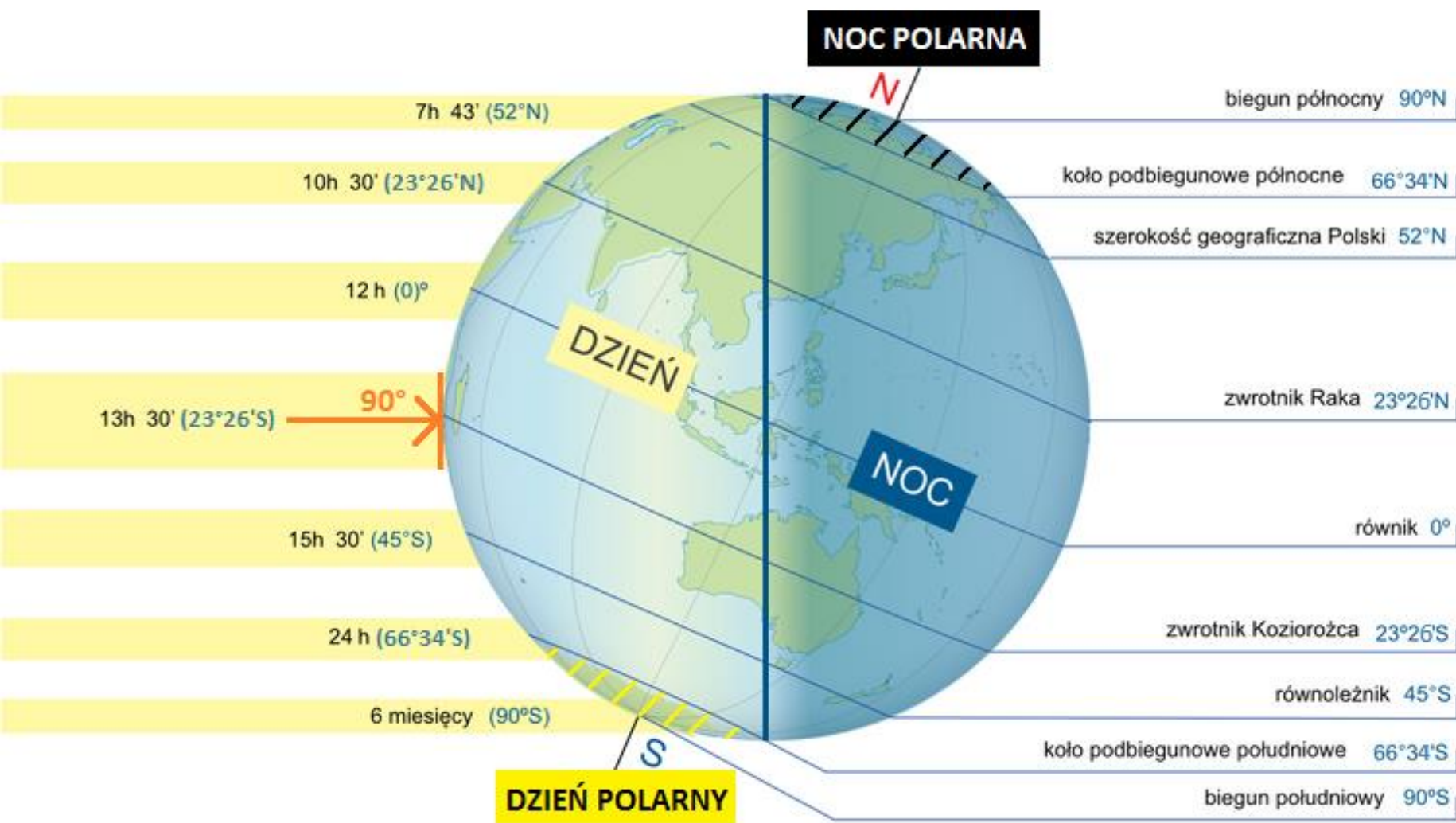
równonoc wiosenna (21 marca) i jesienna (23 września)



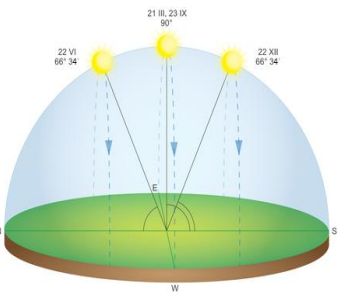
przesilenie letnie (22 czerwca)



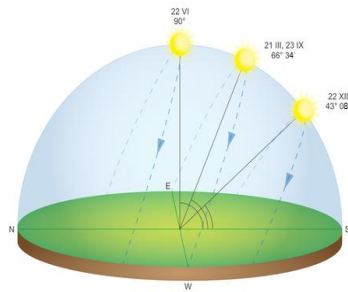
przesilenie zimowe (22 grudnia)



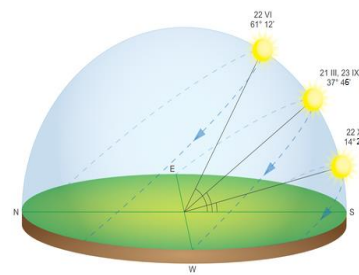
Równik - 0°



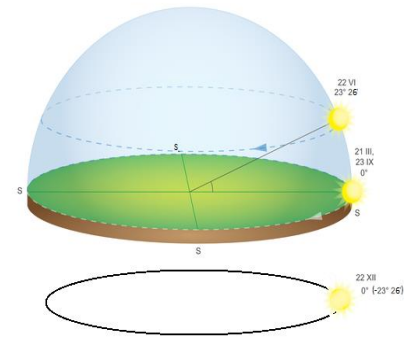
Zwrotnik Raka (23°26'N)



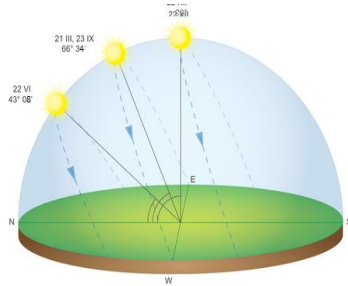
Warszawa (52°14'N)



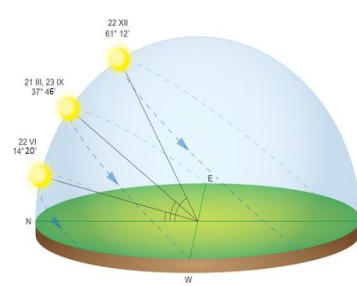
Biegun Północny (90°N)



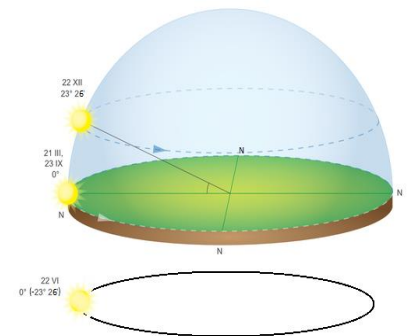
Zwrotnik Koziorożca (23°26'S)

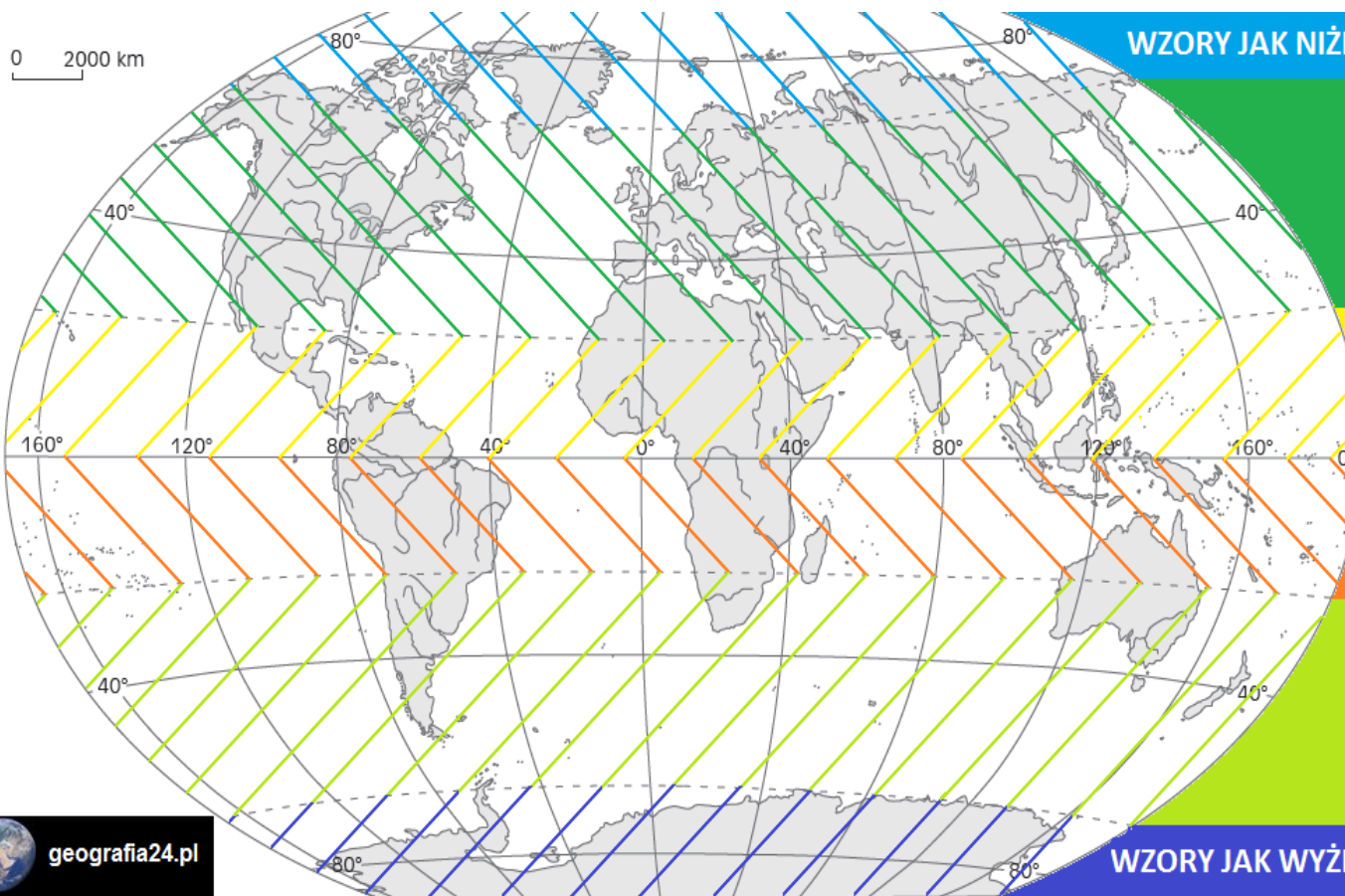


Argentyna (52°14'S)



Biegun Południowy (90°S)





WZORY JAK NIŻEJ + ZJAWISKO **DNIA** I NOCY POLARNEJ

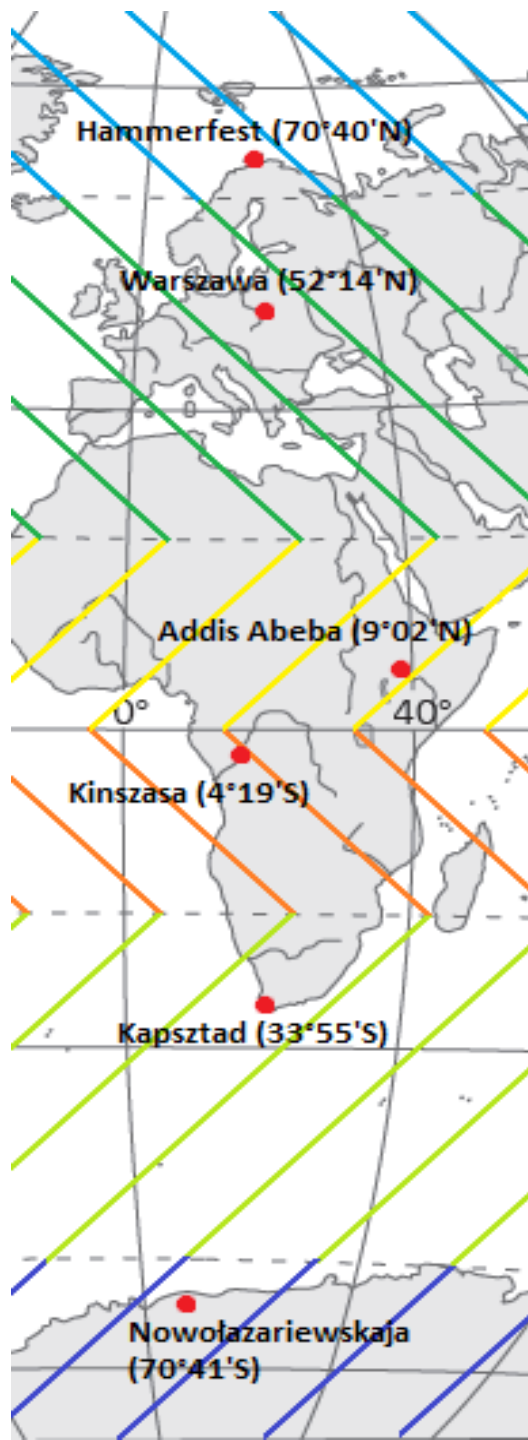
22 VI: $90^\circ - \phi + 23^\circ 26'$ 21 III i 23 IX:
22 XII: $90^\circ - \phi - 23^\circ 26'$ $90^\circ - \phi$

22 VI: $90^\circ + \phi - 23^\circ 26'$ 21 III i 23 IX:
22 XII: $90^\circ - \phi - 23^\circ 26'$ $90^\circ - \phi$

22 VI: $90^\circ - \phi - 23^\circ 26'$ 21 III i 23 IX:
22 XII: $90^\circ + \phi - 23^\circ 26'$ $90^\circ - \phi$

22 VI: $90^\circ - \phi - 23^\circ 26'$ 21 III i 23 IX:
22 XII: $90^\circ - \phi + 23^\circ 26'$ $90^\circ - \phi$

WZORY JAK WYŻEJ + ZJAWISKO **DNIA** I NOCY POLARNEJ



HAMMERFEST:

22 VI: $90^\circ - 70^\circ 40' + 23^\circ 26' = 19^\circ 20' + 23^\circ 26' = 42^\circ 46'$.

22 XII: $90^\circ - 70^\circ 40' - 23^\circ 26' = 19^\circ 20' - 23^\circ 26' = -4^\circ 06'$ (NOC POLARNA). Górowanie = 0° .

21 III i 23 IX: $90^\circ - 70^\circ 40' = 19^\circ 20'$.

WARSZAWA:

22 VI: $90^\circ - 52^\circ 14' + 23^\circ 26' = 37^\circ 46' + 23^\circ 26' = 61^\circ 12'$.

22 XII: $90^\circ - 52^\circ 14' - 23^\circ 26' = 37^\circ 46' - 23^\circ 26' = 14^\circ 20'$.

21 III i 23 IX: $90^\circ - 52^\circ 14' = 37^\circ 46'$.

ADDIS ABEBA:

22 VI: $90^\circ + 9^\circ 02' - 23^\circ 26' = 99^\circ 02' - 23^\circ 26' = 76^\circ 16'$

22 XII: $90^\circ - 9^\circ 02' - 23^\circ 26' = 80^\circ 58' - 23^\circ 26' = 57^\circ 32'$

21 III i 23 IX: $90^\circ - 9^\circ 02' = 80^\circ 58'$

KINSZASA:

22 VI: $90^\circ - 4^\circ 19' - 23^\circ 26' = 85^\circ 41' - 23^\circ 26' = 62^\circ 15'$.

22 XII: $90^\circ + 4^\circ 19' - 23^\circ 26' = 94^\circ 19' - 23^\circ 26' = 70^\circ 53'$.

21 III i 23 IX: $90^\circ - 4^\circ 19' = 85^\circ 41'$.

KAPSZTAD:

22 VI: $90^\circ - 33^\circ 55' - 23^\circ 26' = 56^\circ 05' - 23^\circ 26' = 32^\circ 39'$.

22 XII: $90^\circ - 33^\circ 55' + 23^\circ 26' = 56^\circ 05' + 23^\circ 26' = 79^\circ 31'$.

21 III i 23 IX: $90^\circ - 33^\circ 55' = 56^\circ 05'$.

NOWOŁAZARIEWSKAJA:

22 VI: $90^\circ - 70^\circ 41' - 23^\circ 26' = 19^\circ 19' - 23^\circ 26' = -4^\circ 07'$ (NOC POLARNA). Górowanie = 0° .

22 XII: $90^\circ - 70^\circ 41' + 23^\circ 26' = 19^\circ 19' + 23^\circ 26' = 42^\circ 45'$.

21 III i 23 IX: $90^\circ - 70^\circ 41' = 19^\circ 19'$.