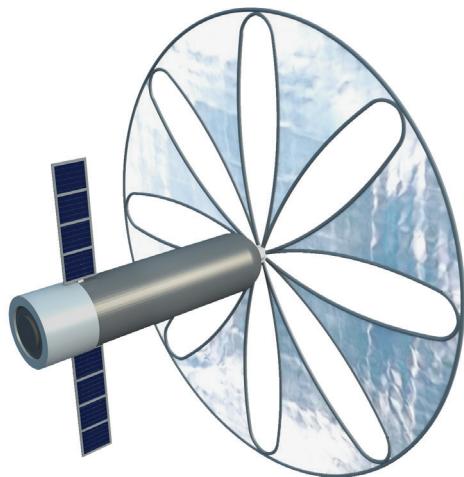


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FIGURA 2.1

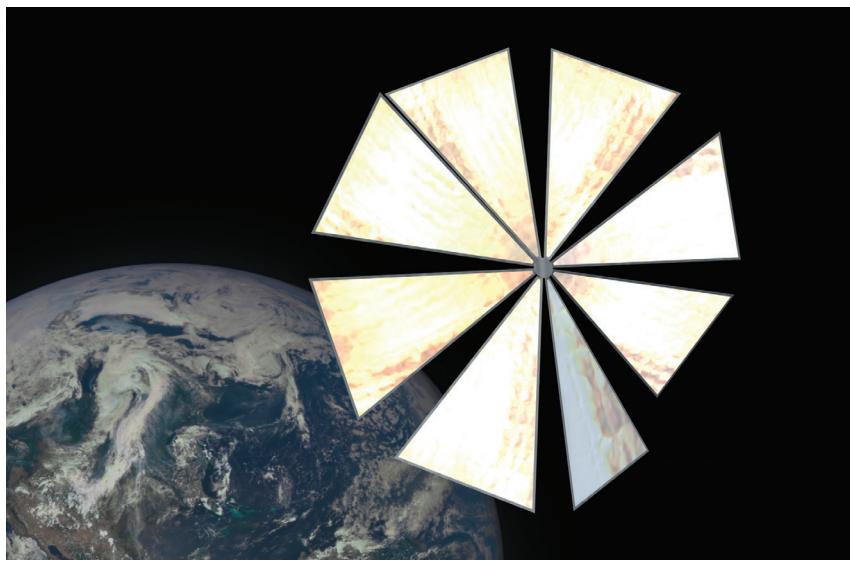
Rappresentazione artistica della vela russa *Znamya-2,5*



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FIGURA 2.2

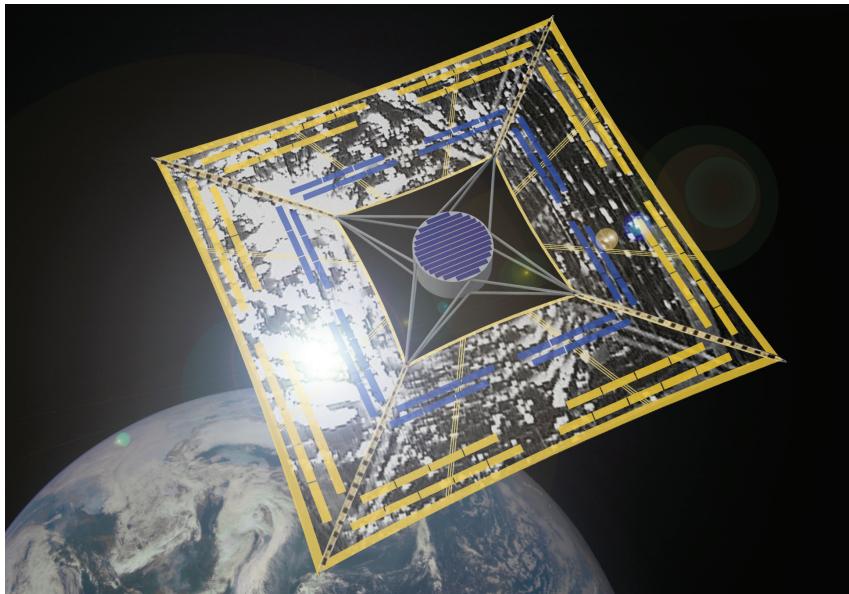
Rappresentazione artistica della vela *Cosmos 1*



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FIGURA 2.3

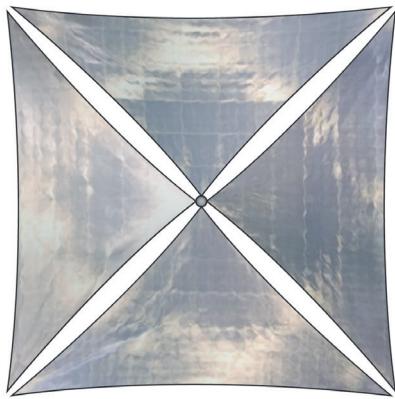
Rappresentazione artistica della vela giapponese *IKAROS*



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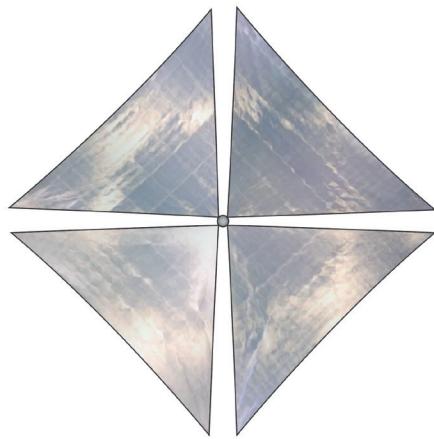
FIGURA 2.4

Schema di una vela quadrata



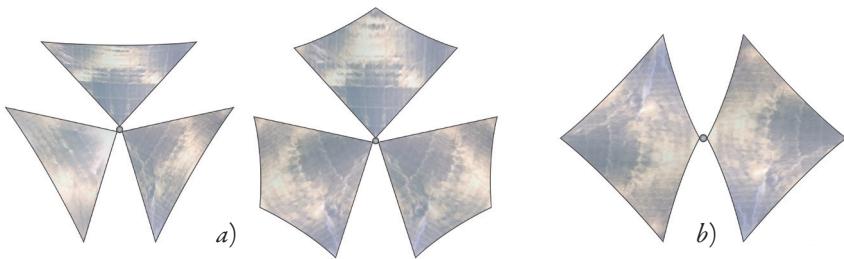
---

**FIGURA 2.5**  
Schema di una quadrivela



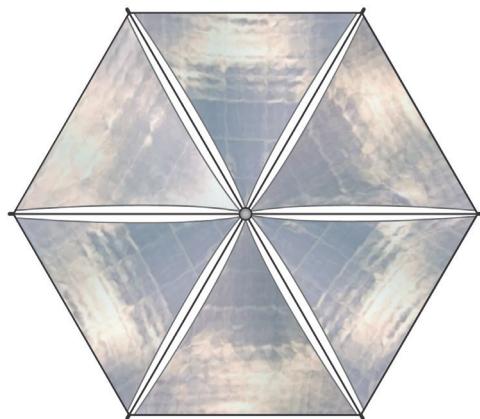
---

**FIGURA 2.6**  
Schema di una trivela (*a*) e di una vela a farfalla (*b*)



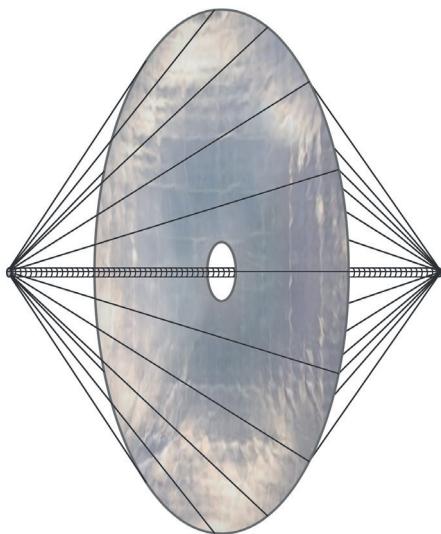
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**FIGURA 2.7**  
Schema di una vela a disco



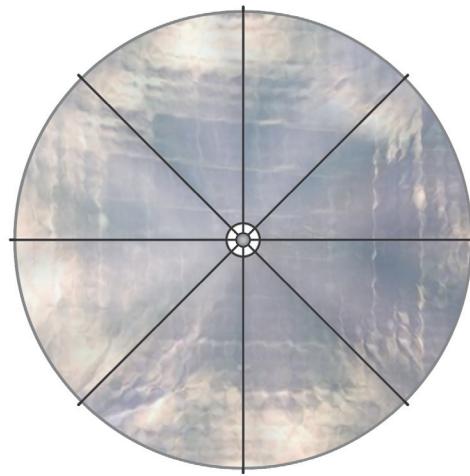
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**FIGURA 2.8**  
Schema di una vela ad anello



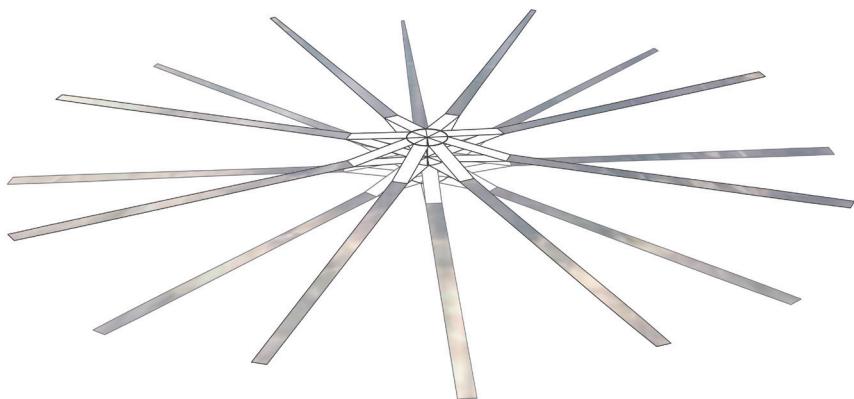
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**FIGURA 2.9**  
Schema di una vela circolare



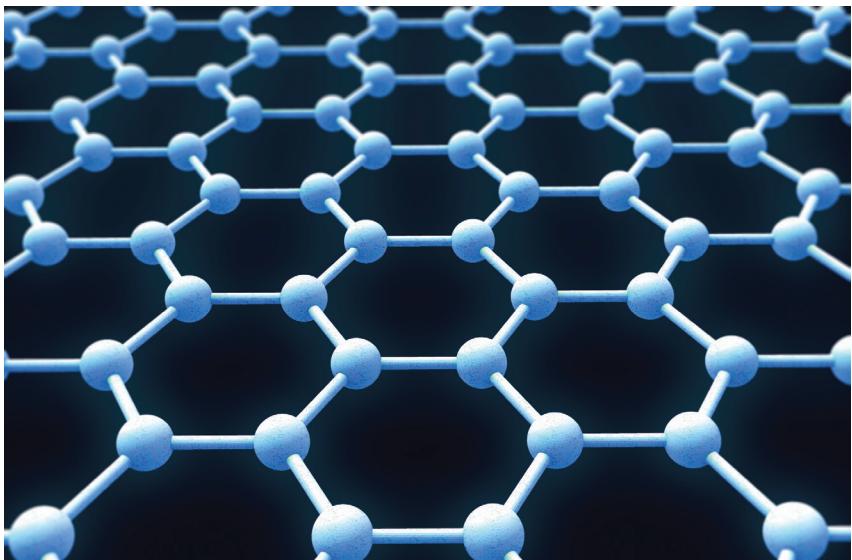
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**FIGURA 2.10**  
Schema di una vela eliogira



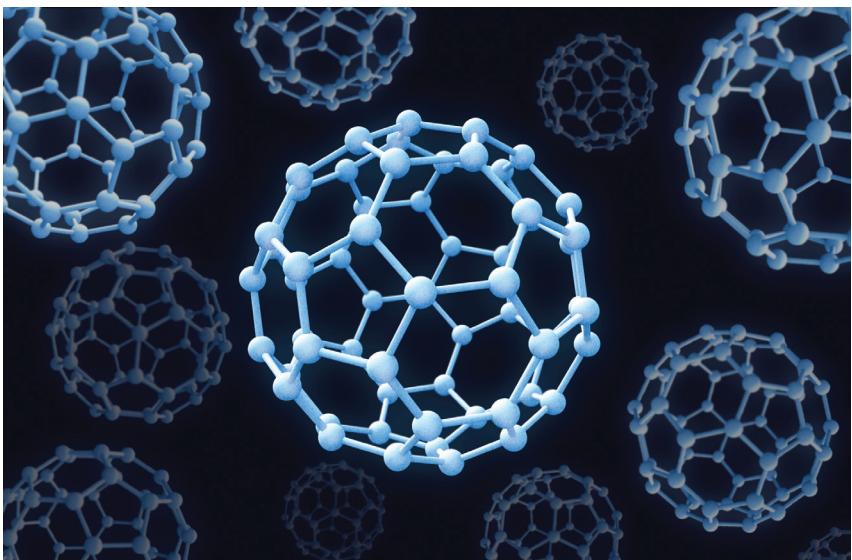
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**FIGURA 2.11**  
Rappresentazione della struttura del grafene



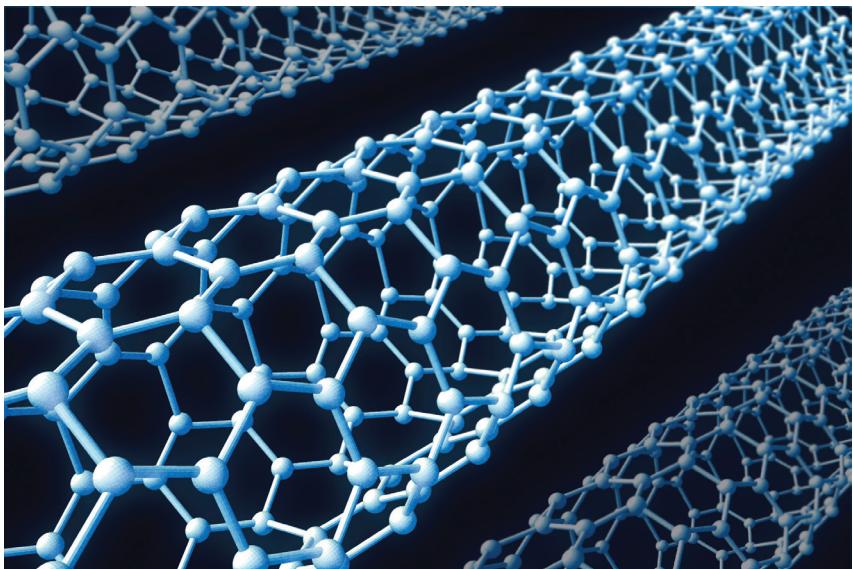
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**FIGURA 2.12**  
Rappresentazione della struttura del buckminsterfullerene



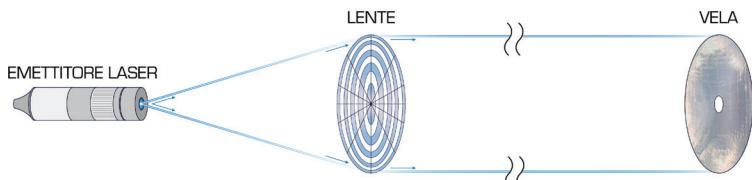
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**FIGURA 2.13**  
Rappresentazione di nanotubo di carbonio



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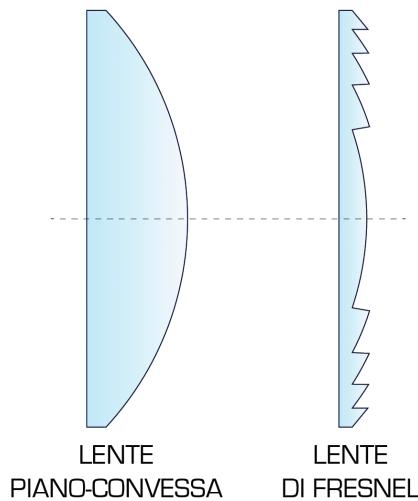
**FIGURA 2.14**  
Sistema laser-lente-vela per evitare che il fascio laser diverga a grandi distanze



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FIGURA 2.15

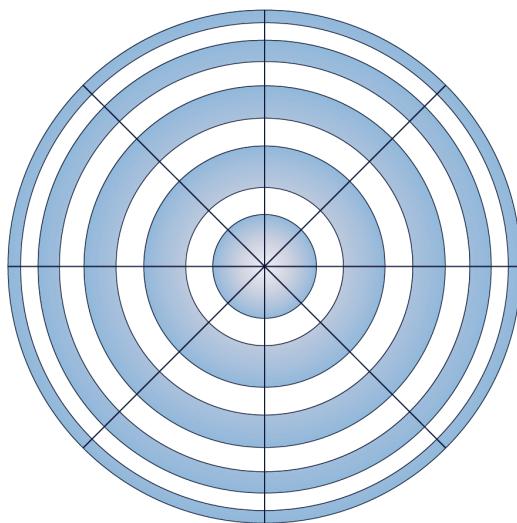
Lente convenzionale piano-convessa (a sinistra) ed equivalente lente di Fresnel (a destra)



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FIGURA 2.16

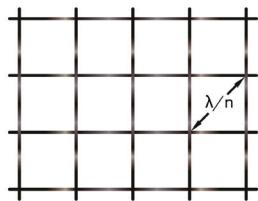
Configurazione della lente di Fresnel che potrebbe essere usata nello spazio



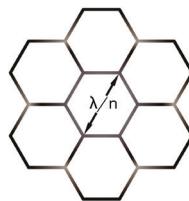
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FIGURA 2.17

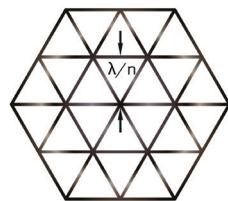
Possibili configurazioni per la maglia delle vele a microonde



QUADRATO  
(4 FILI PER OGNI VERTICE)



ESAGONALE  
(3 FILI PER OGNI VERTICE)



TRIANGOLARE  
(6 FILI PER OGNI VERTICE)

Legenda:  $\lambda$  = lunghezza d'onda del fascio di microonde;  $n$  = numero di fili distribuiti per tutta la larghezza della vela.

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FIGURA 2.18

Possibile schema della vela magnetica a vento solare

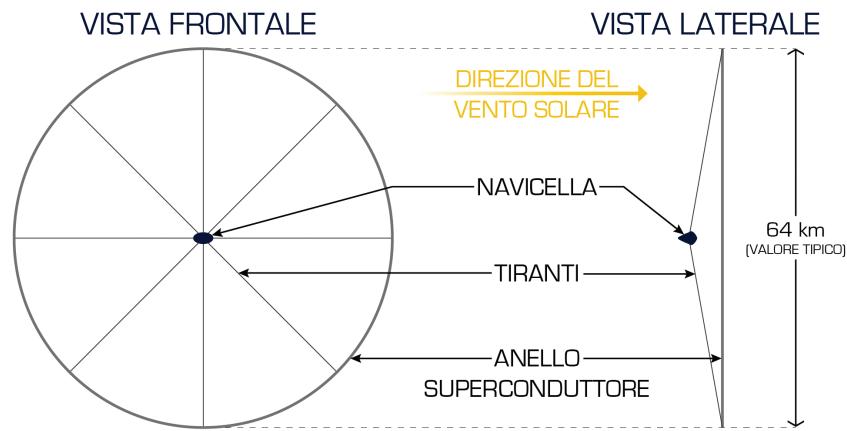


FIGURA 2.19

Rappresentazione artistica della vela magnetica a fascio di plasma artificiale

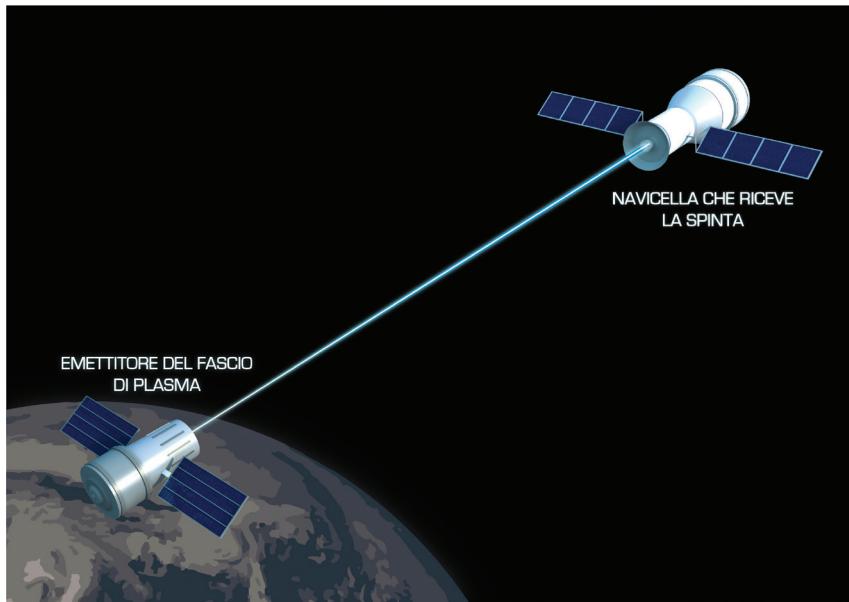
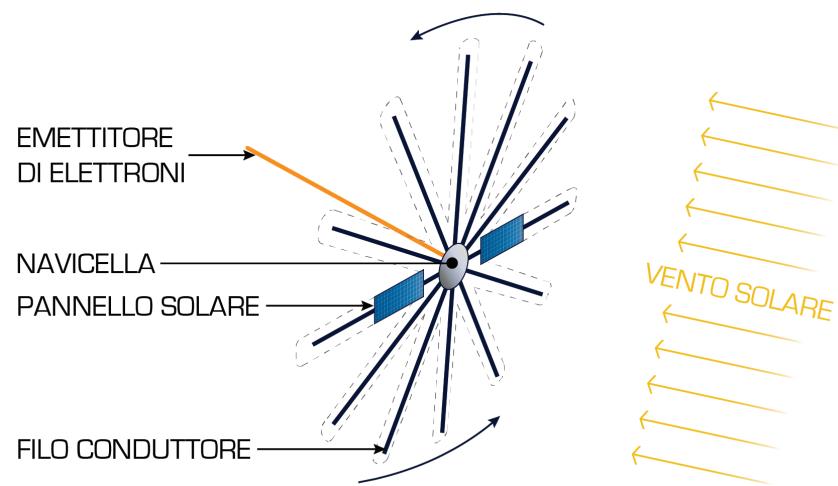


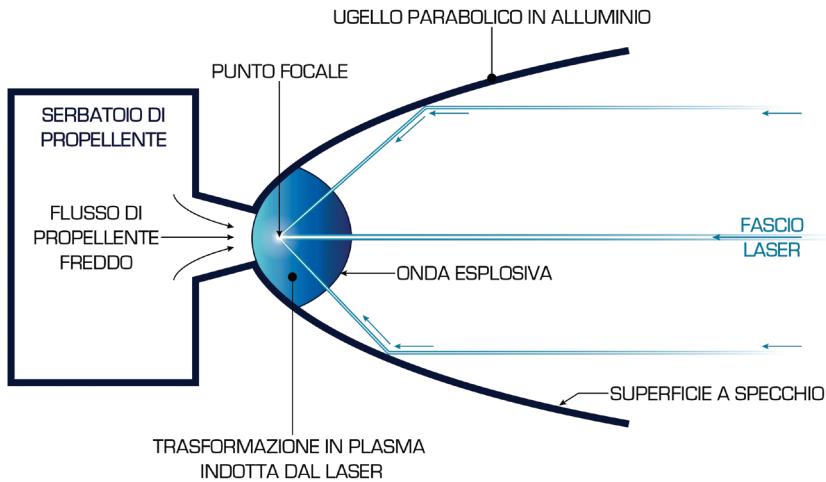
FIGURA 2.20

Schema di vela elettrica



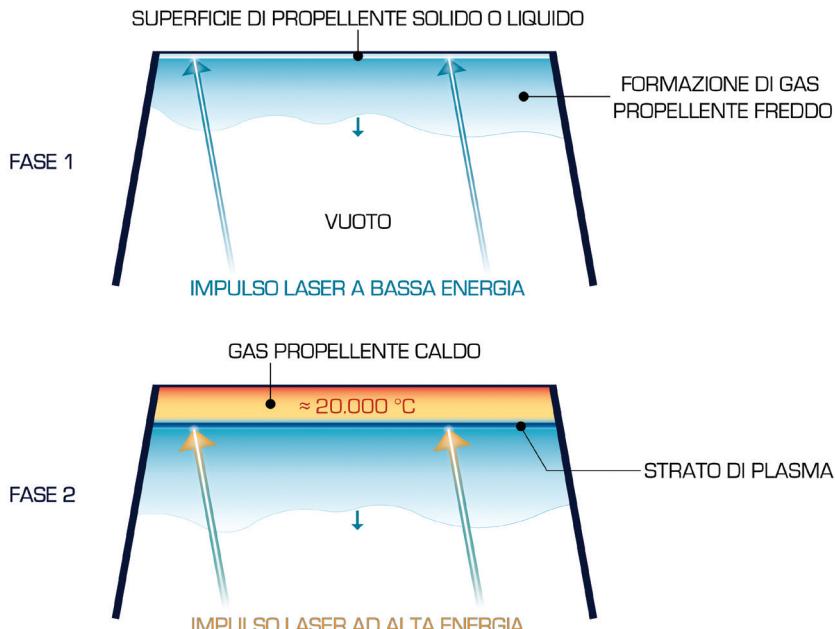
---

FIGURA 3.1  
Schema di propulsore termico a laser pulsato nella configurazione a valvola acustica



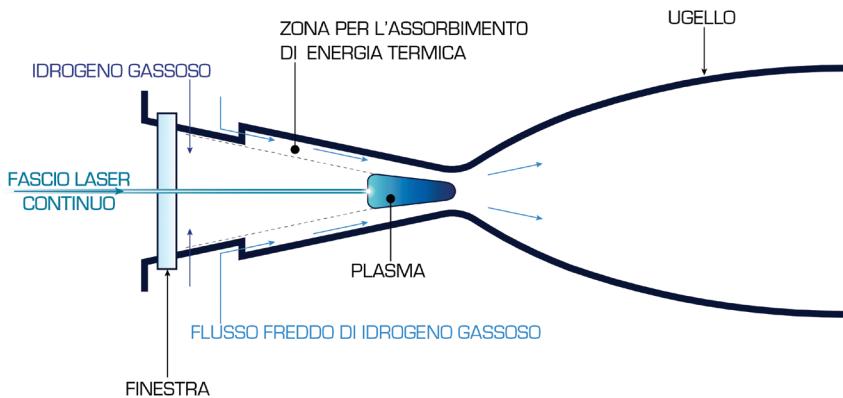
---

FIGURA 3.2  
Schema di propulsore termico a laser pulsato nella configurazione a onda di detonazione



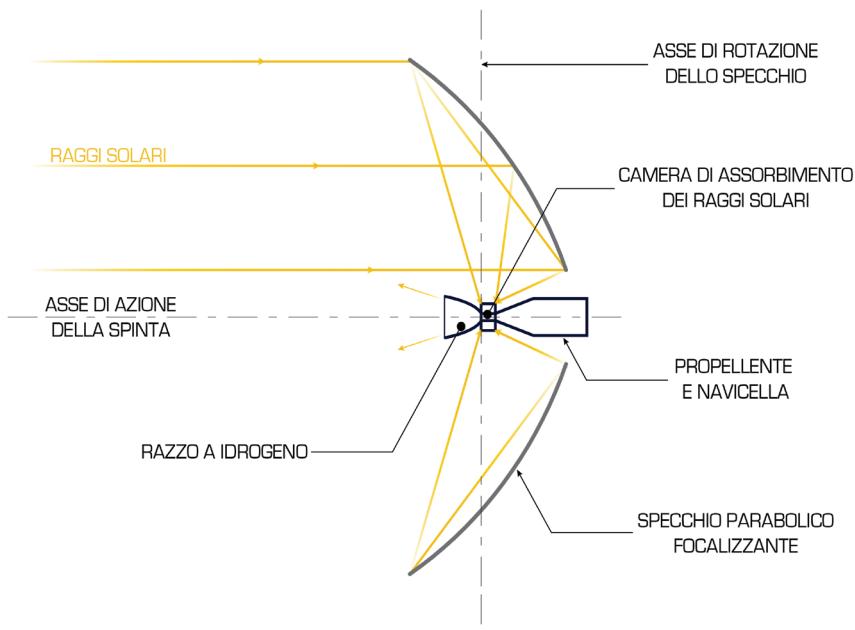
---

**FIGURA 3.3**  
Schema di propulsore termico a laser continuo nella configurazione a *Bremsstrahlung* inverso



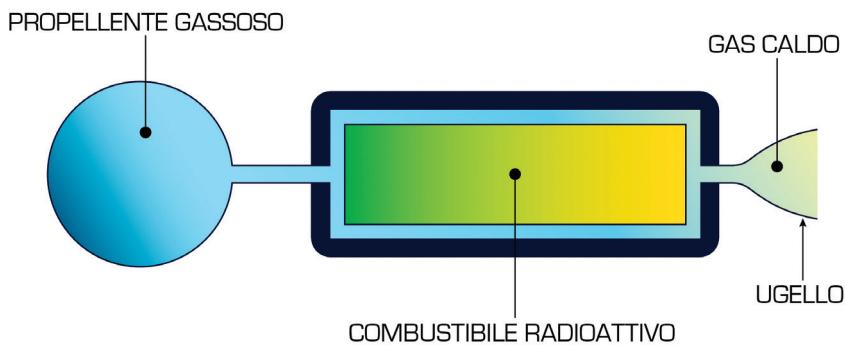
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**FIGURA 3.4**  
Schema di propulsore termico solare



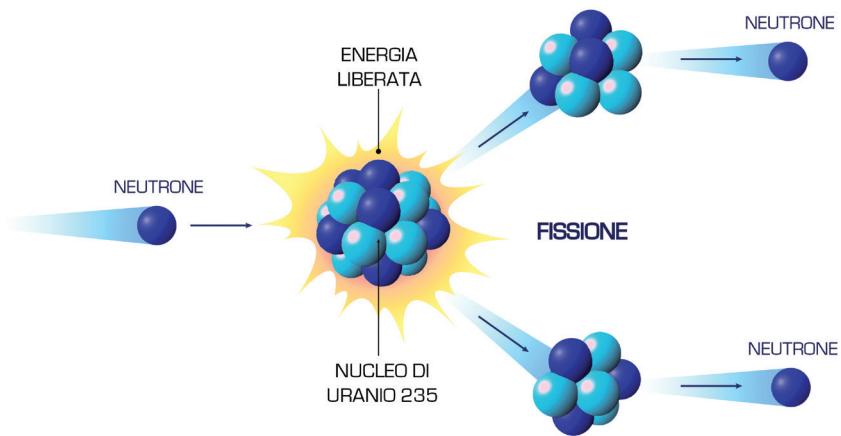
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FIGURA 4.1  
Schema generale di propulsore termoradioattivo



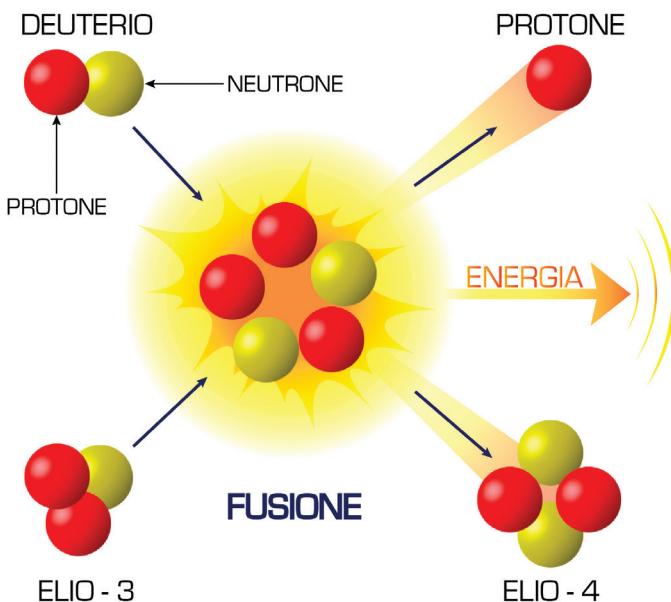
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FIGURA 5.1  
Schema di fissione nucleare per l'uranio 235



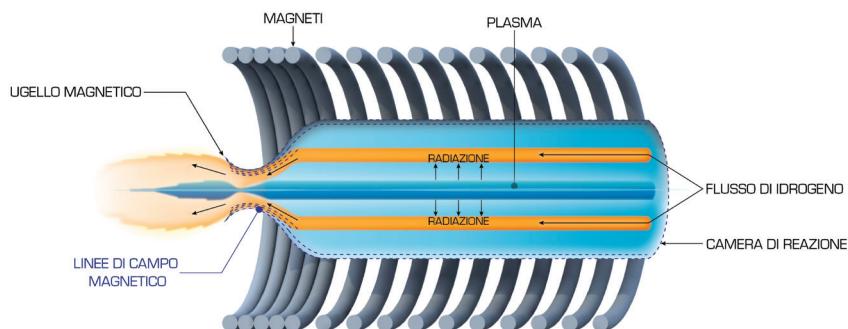
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FIGURA 5.2  
Schema di fusione nucleare pulita



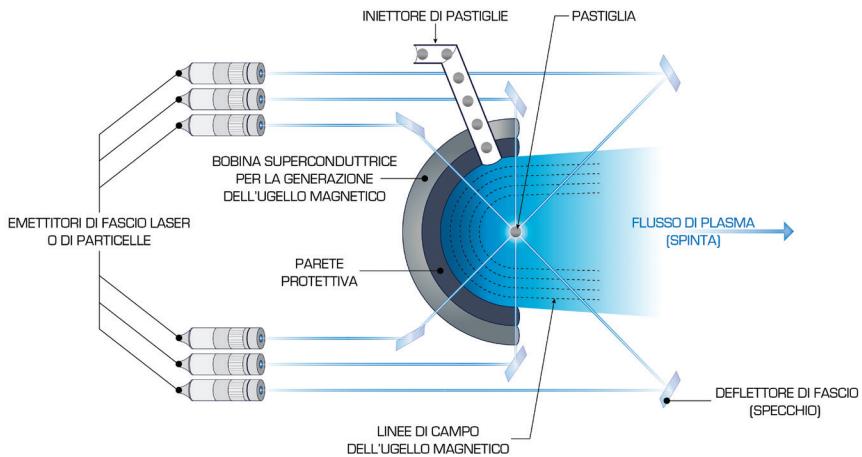
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FIGURA 5.3  
Schema di confinamento magnetico per la fusione nucleare



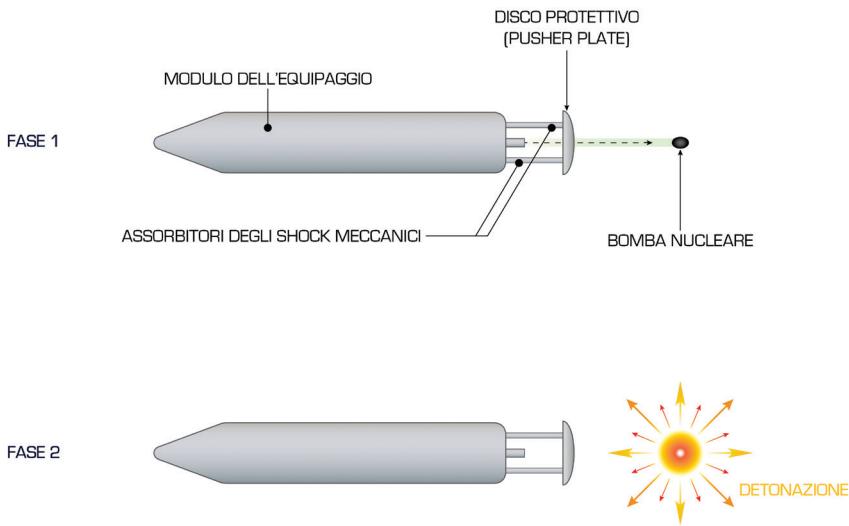
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**FIGURA 5.4**  
Schema di confinamento inerziale per la fusione nucleare



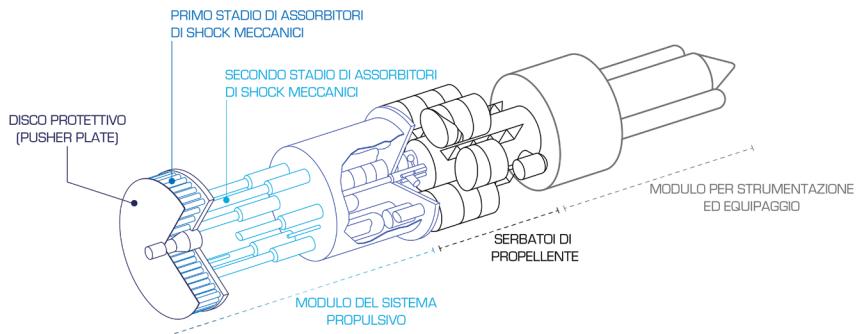
---

**FIGURA 5.5**  
Schema di propulsore a bombe a fissione nucleare



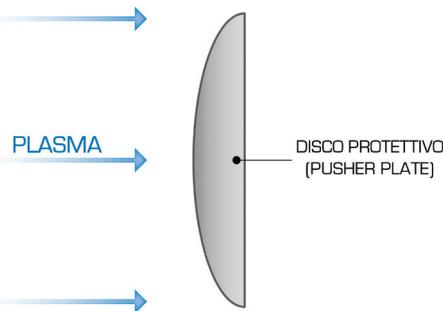
---

**FIGURA 5.6**  
Schema della navicella *Orion*



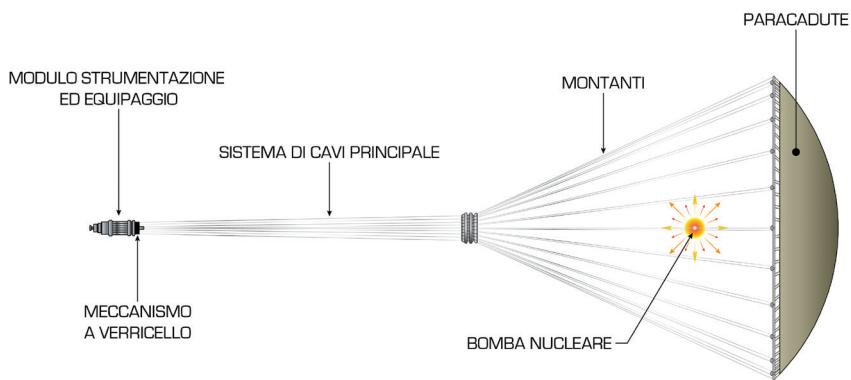
---

**FIGURA 5.7**  
Configurazione geometrica del *pusher plate* necessaria per sopportare gli elevati shock meccanici dovuti alle onde d'urto



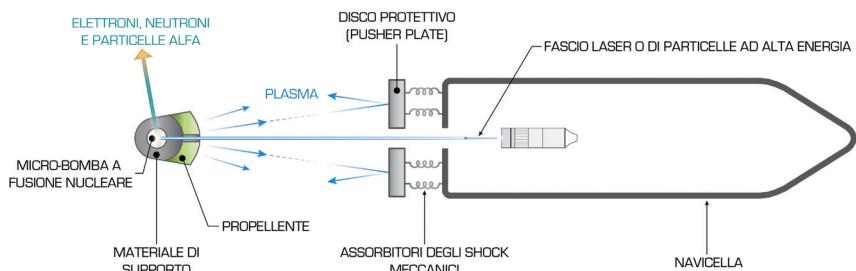
---

**FIGURA 5.8**  
Schema rappresentativo della navicella *Medusa*



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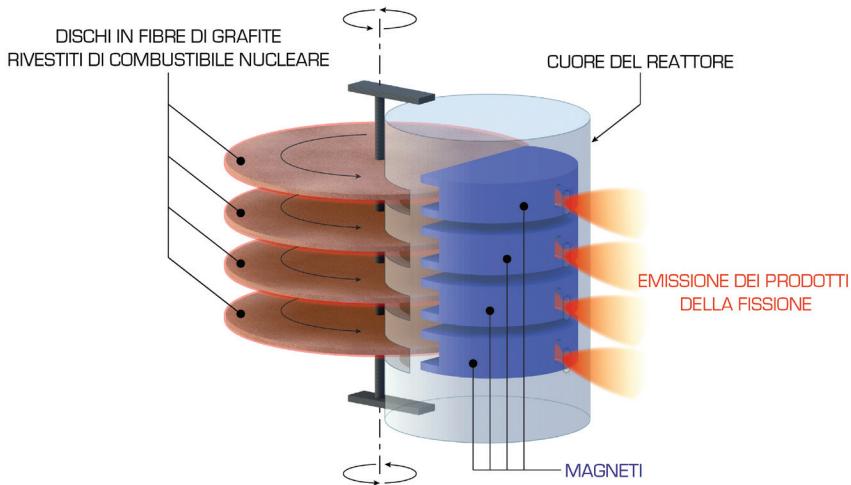
**FIGURA 5.9**  
Schema semplificato di un sistema propulsivo a microbombe a fusione nucleare



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FIGURA 5.IO

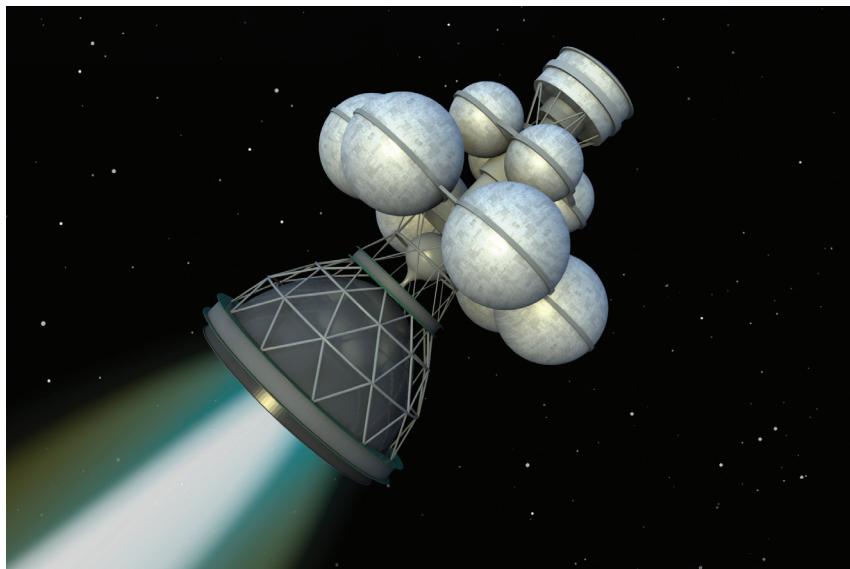
Schema semplificato di un possibile propulsore nucleare a emissione dei soli prodotti di fissione



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FIGURA 5.II

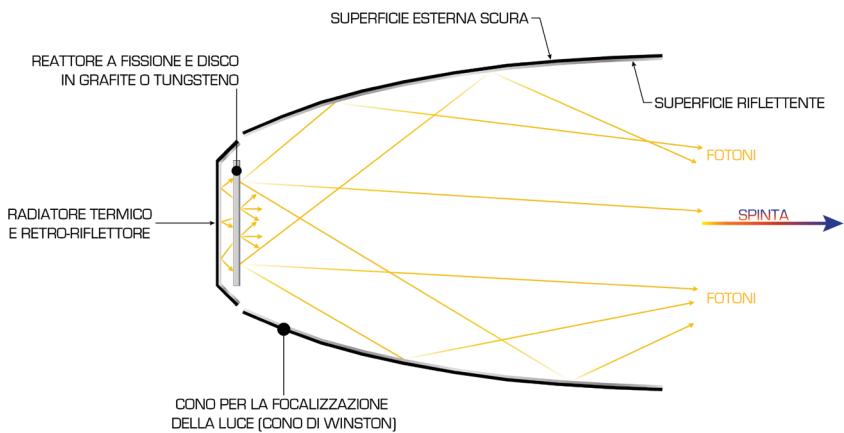
Rappresentazione artistica della navicella *Daedalus*



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FIGURA 5.12

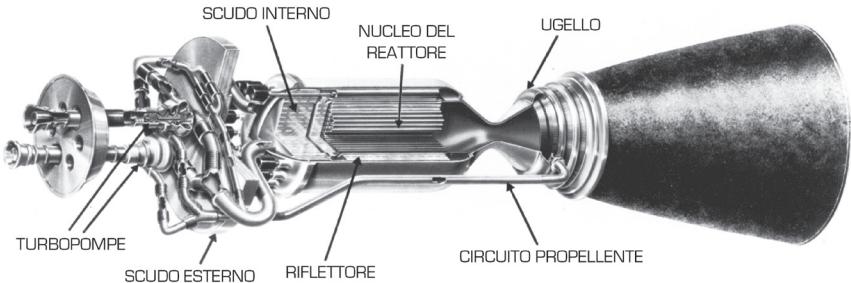
Rappresentazione schematica del propulsore nucleare a emissione di fotoni proposto da Rubbia



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FIGURA 5.13

Propulsore termonucleare a fissione *NERVA*



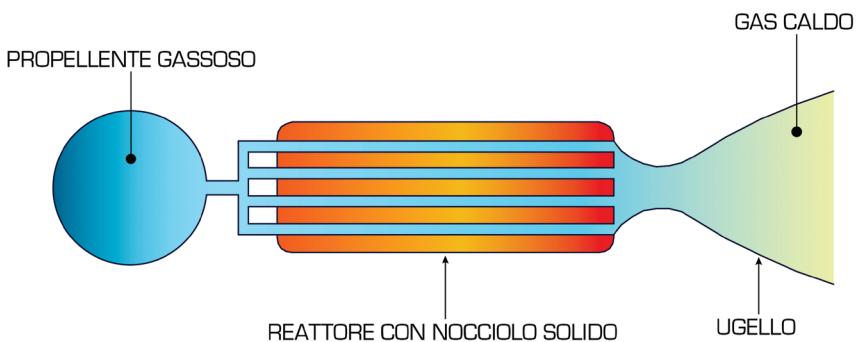
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Courtesy NASA.

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FIGURA 5.14

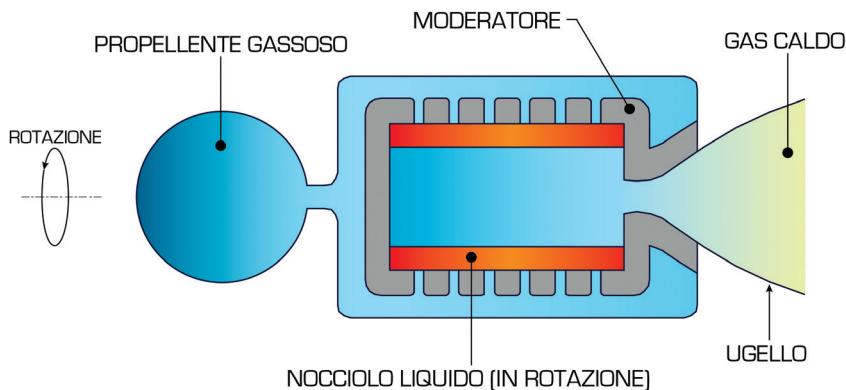
Schema generale di propulsore termonucleare a fissione con nocciolo solido



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FIGURA 5.15

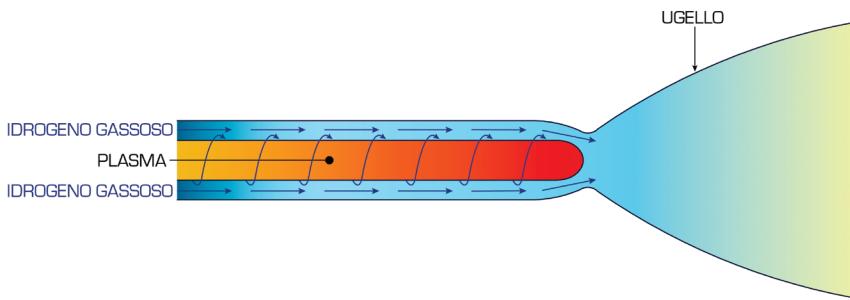
Schema generale di propulsore termonucleare a fissione con nocciolo liquido



---

FIGURA 5.16

Schema generale di propulsore termonucleare a fissione con nocciolo gassoso



---

FIGURA 5.17

Schema generale di propulsore termonucleare a fusione

BOBINE PER IL CAMPO MAGNETICO

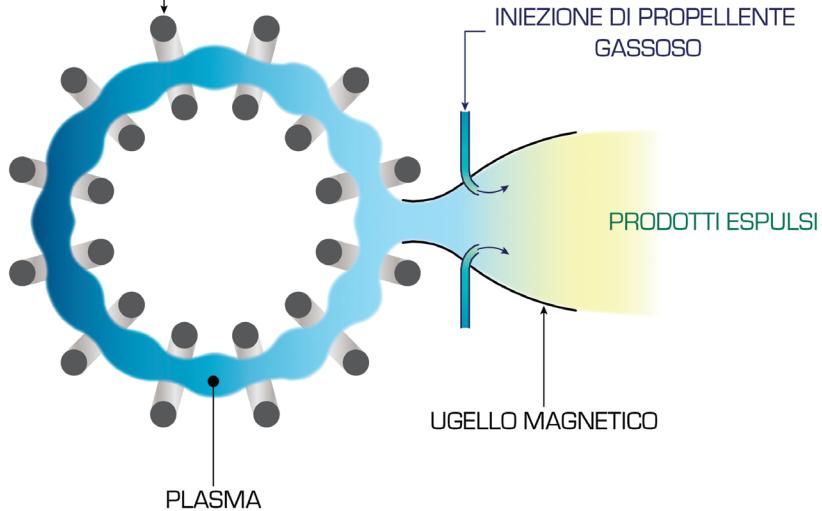
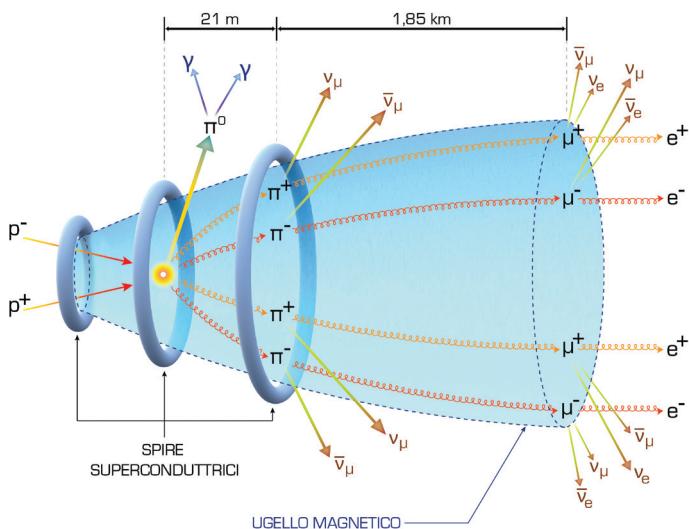


FIGURA 6.1

Propulsore ad antimateria puro: ugello magnetico e reazioni di annichilazione e decadimento radioattivo



$p^+$  = PROTONE

$p^-$  = ANTIPIRONTE

$\pi^0$  = PIONE NEUTRO

$\pi^+$  = PIONE POSITIVO

$\pi^-$  = PIONE NEGATIVO

$\mu^+$  = MUONE POSITIVO

$\mu^-$  = MUONE NEGATIVO

$e^+$  = POSITRONE

$e^-$  = ELETTRONE

$\gamma$  = RAGGIO GAMMA

$\nu_\mu$  = NEUTRINO MUONICO

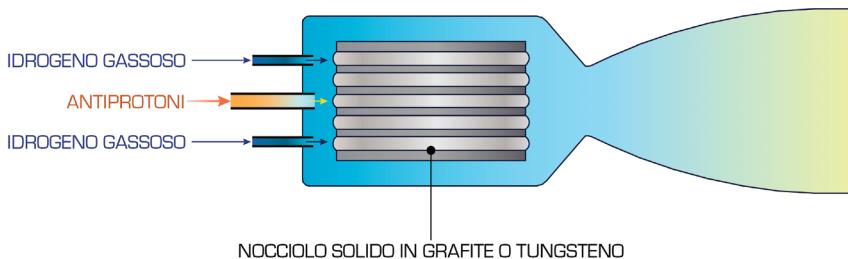
$\bar{\nu}_\mu$  = ANTINEUTRINO MUONICO

$\nu_e$  = NEUTRINO ELETTRONICO

$\bar{\nu}_e$  = ANTINEUTRINO ELETTRONICO

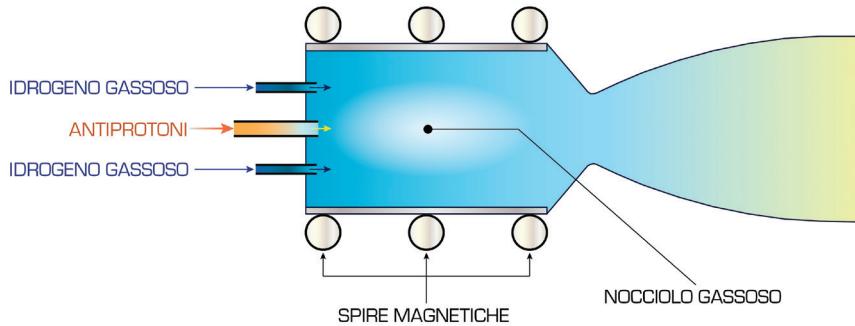
FIGURA 6.2

Propulsore ad antimateria a nocciolo solido



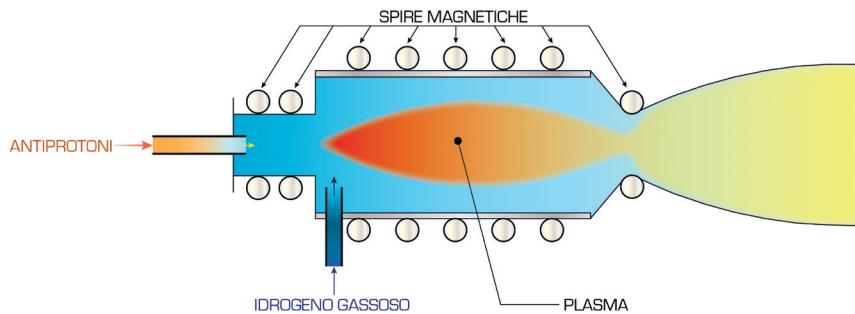
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FIGURA 6.3  
Propulsore ad antimateria a nocciolo gassoso



---

FIGURA 6.4  
Propulsore ad antimateria a nocciolo allo stato di plasma



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FIGURA 6.5

Rappresentazione artistica della navicella *ICAN-II*, con propulsore ad antimateria ACMF

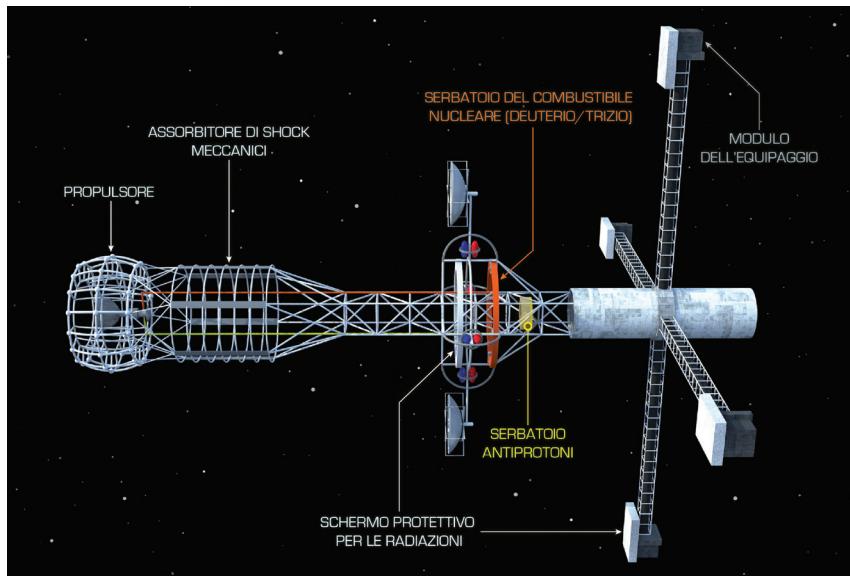


FIGURA 6.6

Rappresentazione artistica della navicella *AIMstar*, con propulsore ad antimateria AIM

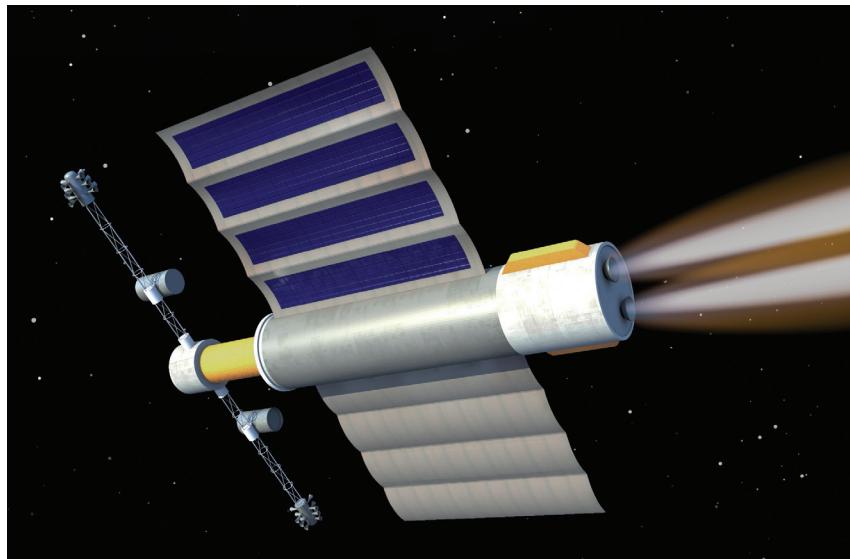


FIGURA 6.7

Rappresentazione schematica di un propulsore ad antimateria GDM

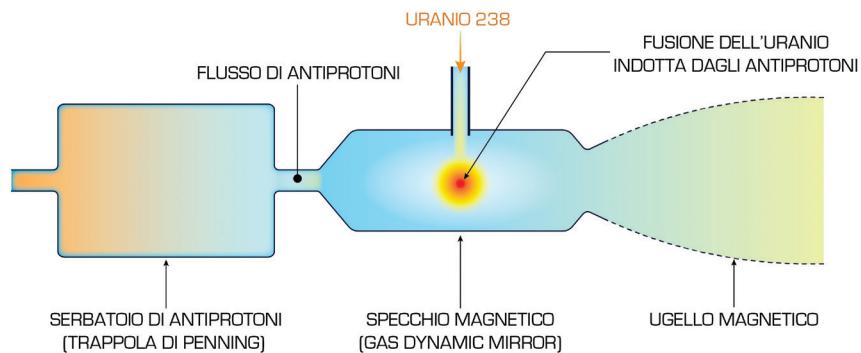


FIGURA 6.8

Configurazione generale di una vela a fissione innescata da antimateria

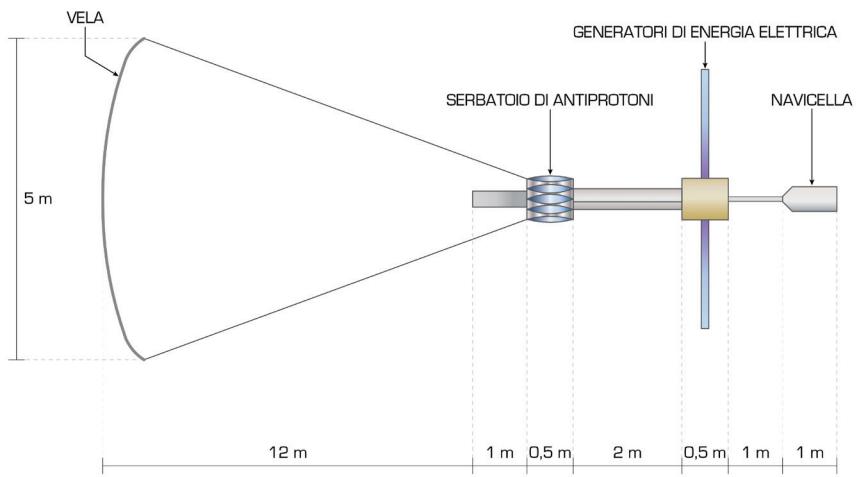


FIGURA 6.9

Impatto degli antiprotoni contro lo strato interno di una vela costituito di uranio

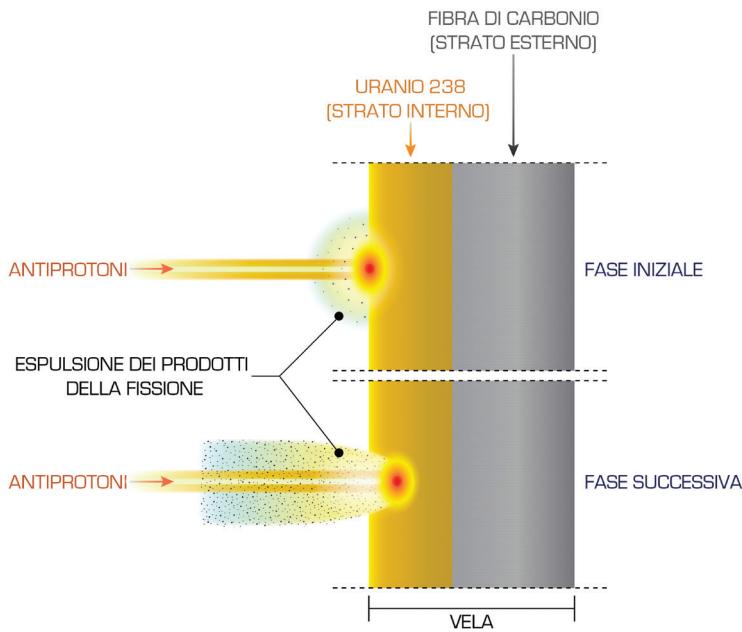
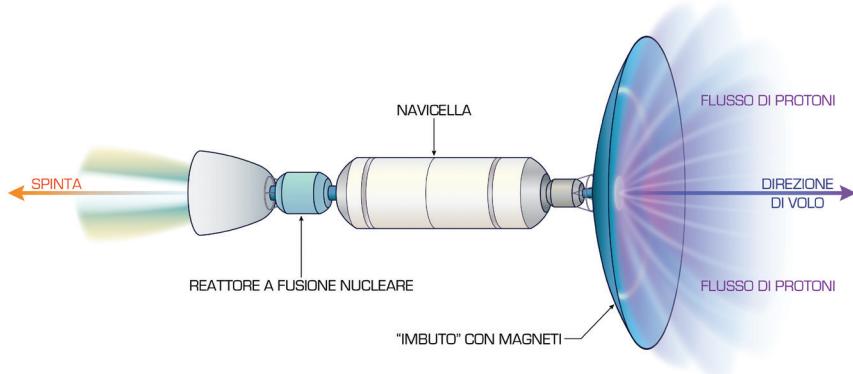


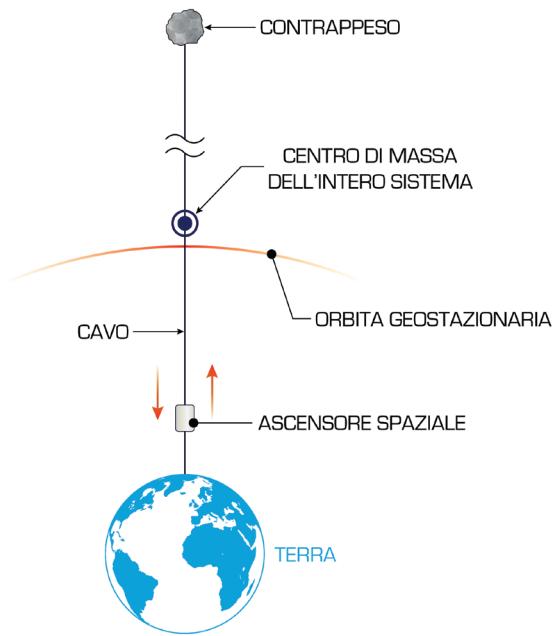
FIGURA 7.1

Rappresentazione del ramjet interstellare di Bussard



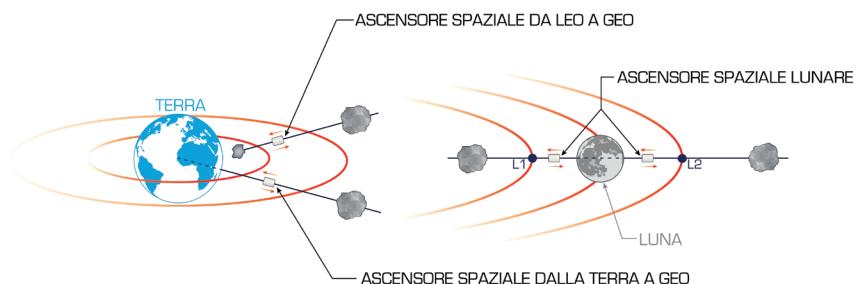
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FIGURA 8.1  
Sistema di ascensore spaziale



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FIGURA 8.2  
Schema di ascensore spaziale per trasferimenti orbitali terrestri e per trasferimenti lunari

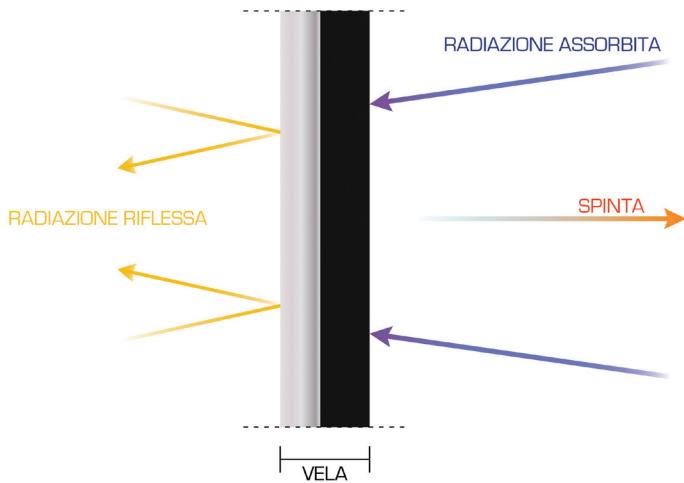


■ = CONTRAPPESO PRINCIPALE  
■ = CONTRAPPESO SECONDARIO  
L1, L2 = PUNTI LAGRANGIANI DEL SISTEMA TERRA-LUNA

---

FIGURA 8.3

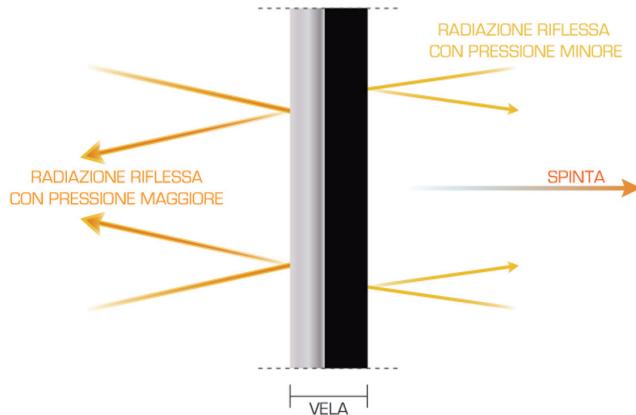
Schema del principio di funzionamento generale della vela differenziale



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FIGURA 8.4

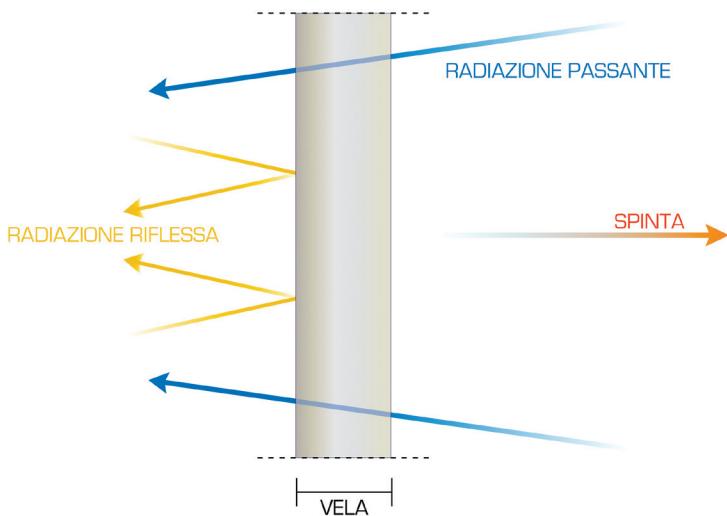
Schema del principio di funzionamento generale della vela a induzione



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FIGURA 8.5

Schema del principio di funzionamento generale della vela diodo



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FIGURA 8.6

Schema del principio di funzionamento di un sistema propulsivo a materia negativa

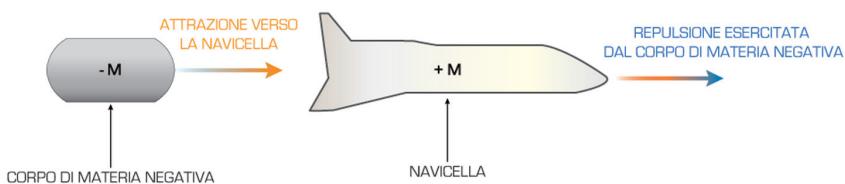
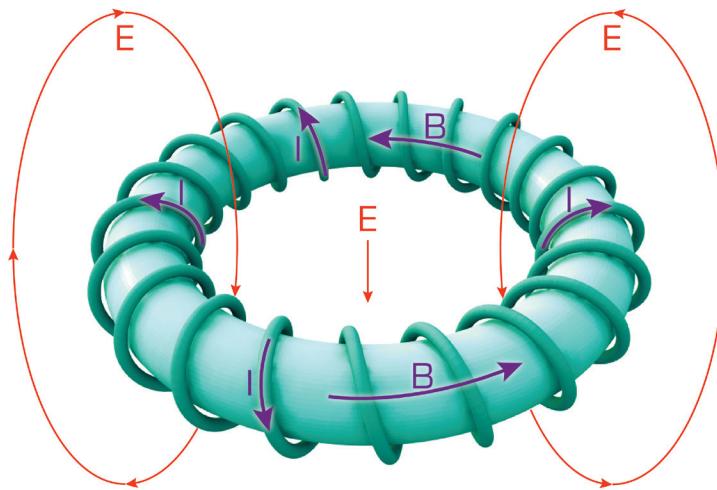


FIGURA 8.7

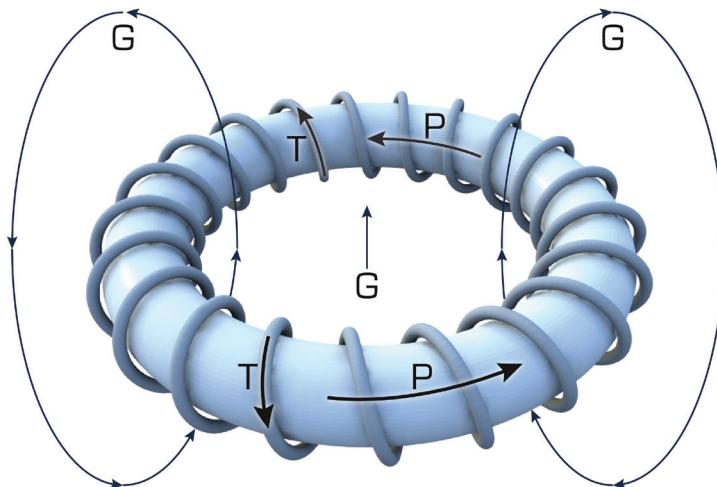
Schema di un sistema per la generazione di un campo elettrico assiale E



Legenda: B = campo magnetico; I = corrente elettrica; E = campo elettrico generato.

FIGURA 8.8

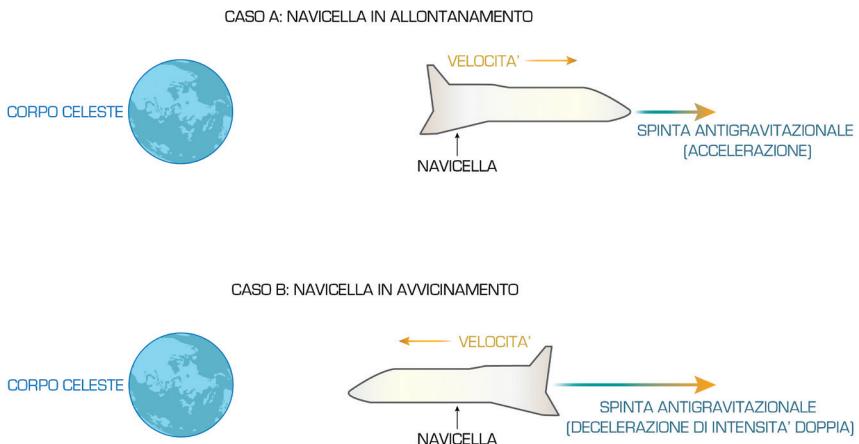
Schema di un sistema per la generazione di un campo antigravitazionale assiale G (analoga con lo schema elettromagnetico di FIG. 8.7)



Legenda: P = portata in massa; T = campo di Lense-Thirring; G = campo gravitazionale artificiale, in questo caso di verso opposto e quindi antigravitazionale.

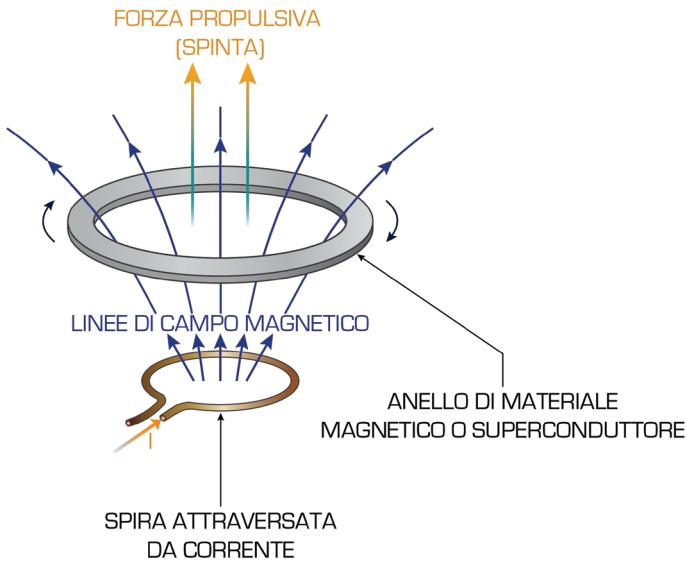
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FIGURA 8.9  
Principio del sistema ad antigravità di Felber



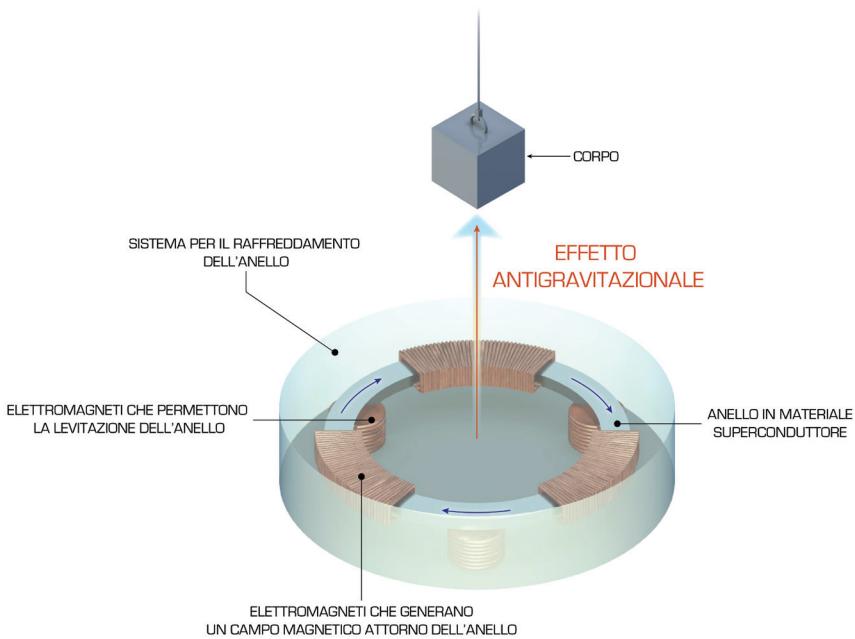
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FIGURA 8.10  
Schema di un possibile dispositivo per la creazione e l'utilizzo della forza di Heim-Lorentz



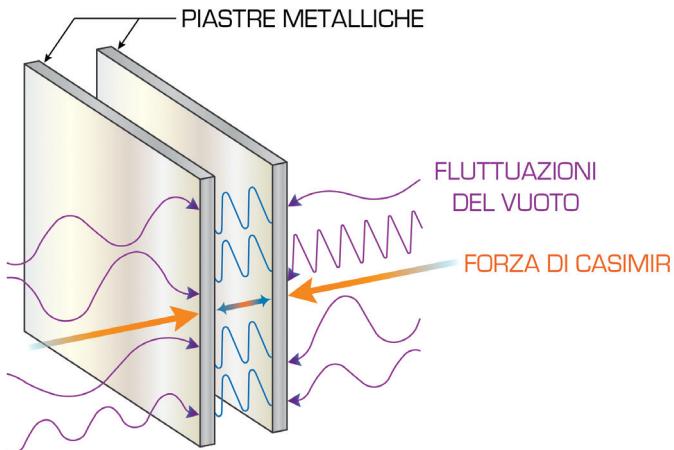
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**FIGURA 8.11**  
Schema del dispositivo ad antigravità proposto da Podkletnov



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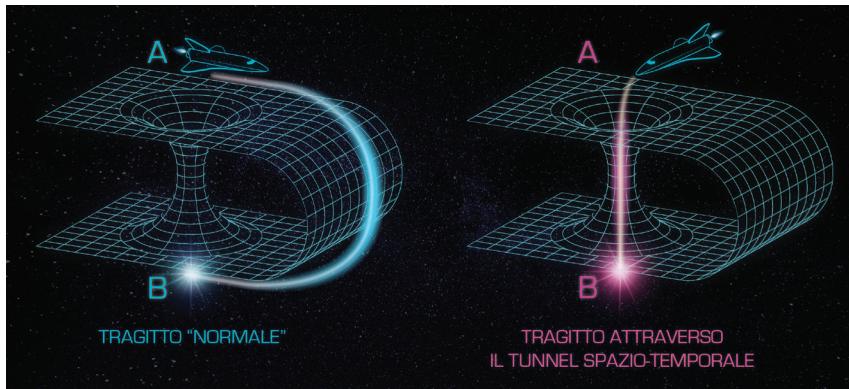
**FIGURA 8.12**  
Macchina di Casimir



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FIGURA 8.13

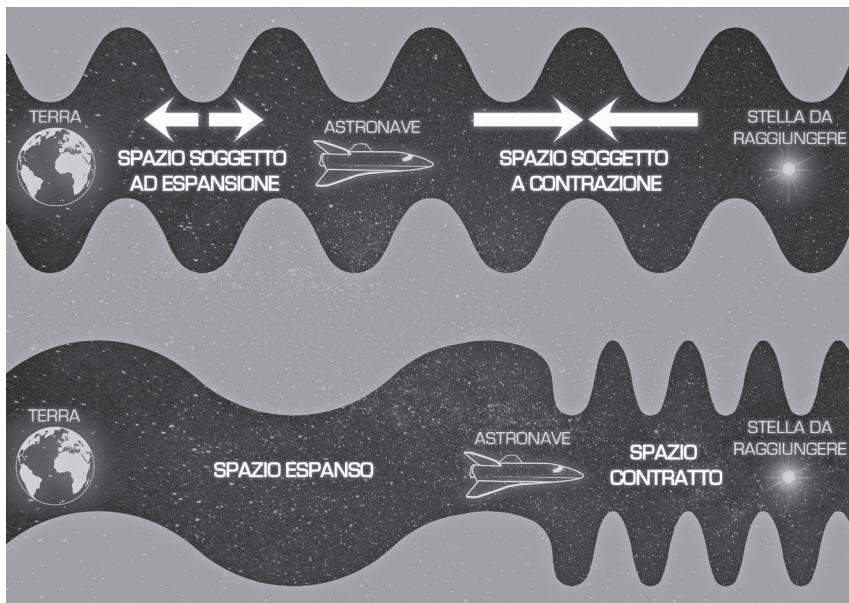
Schema di un tunnel spazio-temporale in un universo a due dimensioni



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FIGURA 8.14

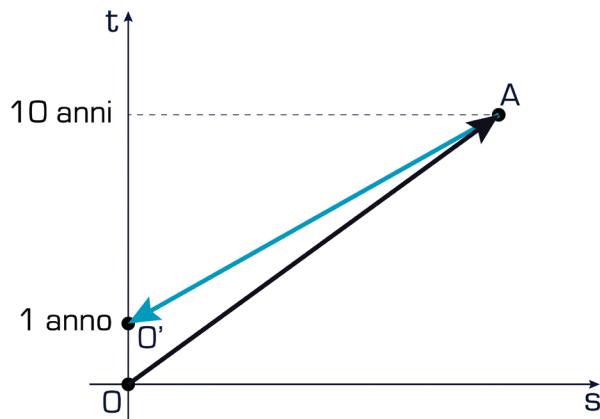
Schema di un possibile viaggio interstellare con l'utilizzo del propulsore a curvatura di Alcubierre



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FIGURA 8.15

Diagramma (non in scala) di un possibile viaggio interstellare con l'utilizzo del tubo di Krasnikov



*Legenda:  $s$  = spazio percorso;  $t$  = tempo trascorso dal punto di vista degli astronauti a bordo della navicella. In nero il viaggio di andata verso la meta A e in chiaro il viaggio di ritorno sfruttando il tubo di Krasnikov.*

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