

Professor Starr's Dream Trip:

**or, how a little technology goes a long way
Unabridged version**



**The story of NASA's New Millennium Program
and how it makes scientists' dreams come true**

**Story by Diane K. Fisher
Illustrations by Alexander Novati**



Professor Starr and all his grads
are working on a scheme
To learn about a universe
that none of us has seen.
They know that light is all around
that's largely undetected.
And strange, yet true, are waves of
gravitation, long neglected.

They long to see and hear and feel
beyond their feeble senses,
To break through complex mysteries
of how and where and when-ces.
"Technology!" they cry "is what we need
to find more answers.
We've gone as far as we can go
without more sense enhancers!



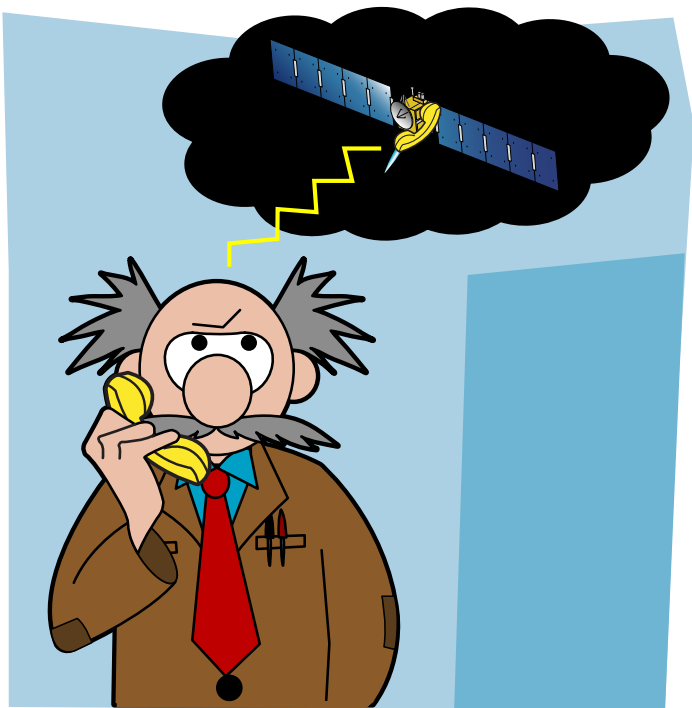
"We also need more ways to go
to places not yet seen.
So many planets, moons, and stars,
and all the rocks between
Have yet to be explored by us,
or any of our probes!
We'd like to see what life is like
on many other globes!"

"Just what the sort of spectro-gravo-
fluxo-speedo-meter,
What sort of thruster, power maker,
communicator, heater,
What sort of attitude control,
what sort of navigator,
And just how good and fast and tough
must be the computator?"



This science team of dauntless searchers
 need more fancy widgets
And far more clever ways to get them
 launched on just a midget
Budget! For they've but meager fortunes,
 not much cash for spending,
But gobs of visions, wishes, plans
 for missions never-ending.

"What to do? Where to look?
 How to get attention?
We need some clever innovation
 and techno-intervention!"
One grad jumps up and shouts out loud
 "I've had a blinding flash!
Let's call NASA! They've no doubt got
 a technologic stash



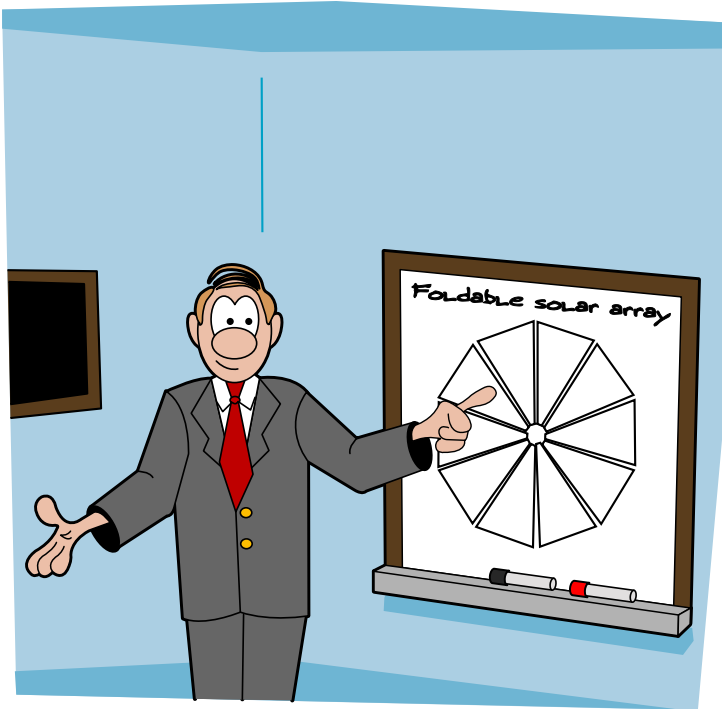
Of all the latest, hi-tech gizmos,
tried and true and tested,
Ready for the likes of us,
stuff others have requested.
Super-sensing image makers.
Multi-micro-sats.
Fast, efficient, tiny engines.
Martian habitats?"

"Well, seems I've heard of some of those,"
The Prof says, looking brighter.
"THEY must have a way to make
our techno-burden lighter!"
And so he phones up NASA Central
in Washington, D.C.,
Finds "New Millennium Program,"
for short, just "NMP."



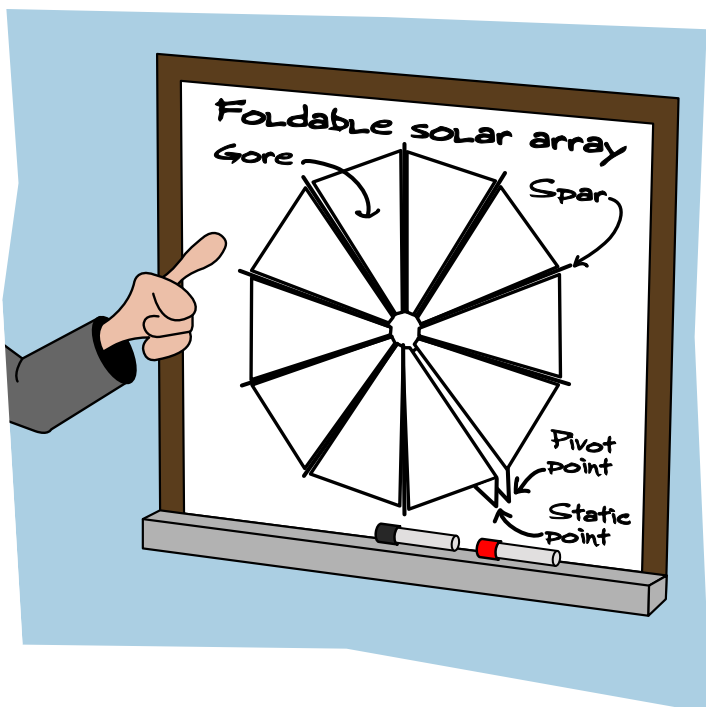
"We're heading for a meeting.
You'd better come along,"
The boss of NMP invites,
"A scientist? You belong!"
Professor Starr writes down his list
and hops aboard a plane
To join the other scientists
and all their hopes explain

To clever NASA engineers
and managers, who then
Have the very tricky job
to pick the ones who'll win
Their wish, and get some special help
with spacey applications,
Like lightweight masts for solar sails
and ion-proof creations.



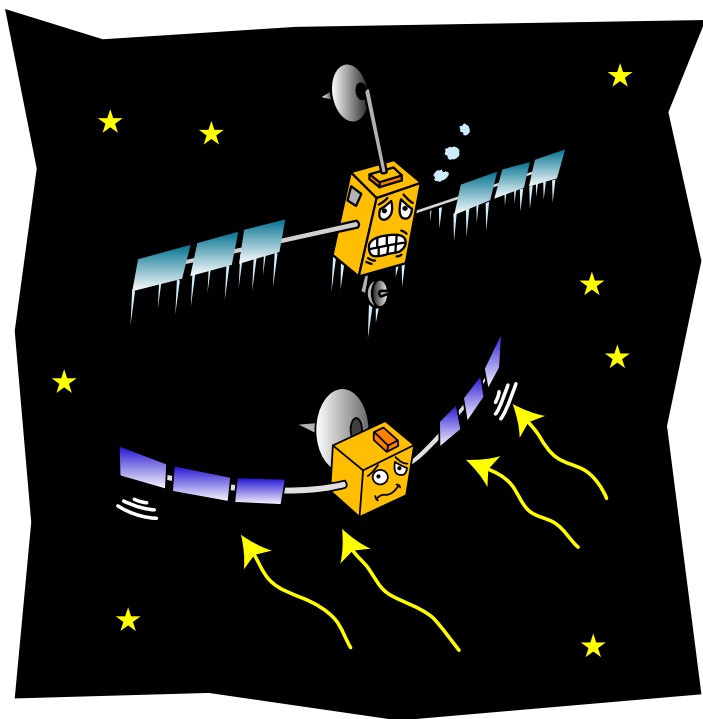
Soon the profs have gone away.
And now these NASA's whizzes
Must figure what to test in space.
So many worthy wishes!
Which wish will bring the greatest prize,
will benefit the most—
Technologies that really help
to bring more answers close.

"Hmmm. Build some tiny satellites
that launch and fly en masse?
Or make and test a novel engine
that runs on xenon gas?
Perhaps computer software
that decides all by itself
What data's worth collecting?
Or a computer off-the-shelf



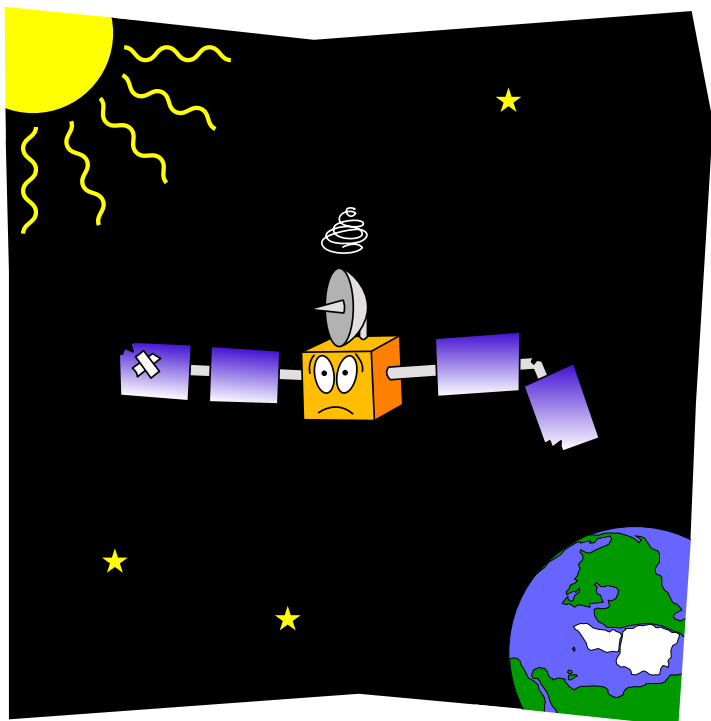
"That, with a little fixing up,
can handle all the stresses
Of being out in outer space
with all its harsh excesses?
Or how about a solar sail?
Or a solar power array?
It barely weighs a birdly ounce
and neatly folds away!

"Perhaps a new star compass
with a gyro in its guts
To keep the spacecraft pointed right
and know its whereabouts?"
They struggle to make up their minds,
to pick the next big task.
To take some innovations,
help perfect them, and then ask,



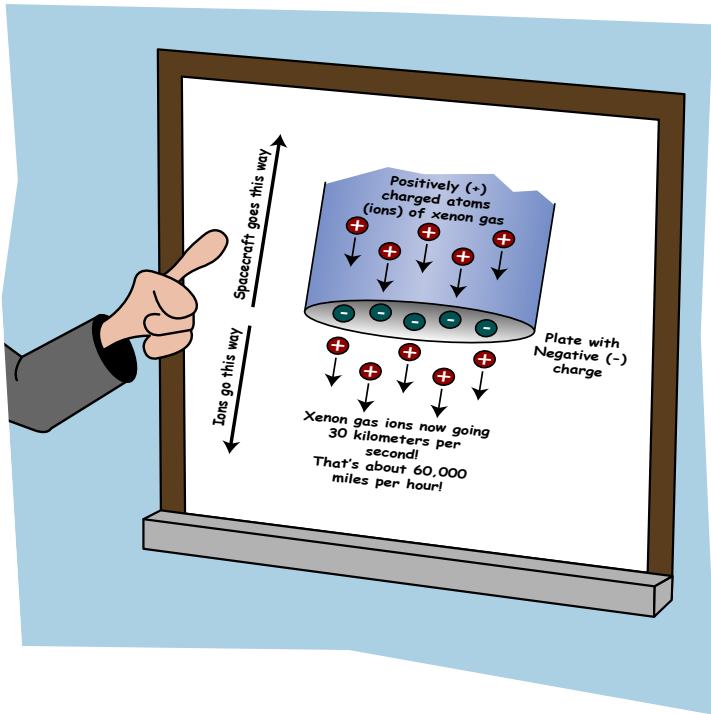
"Now can this new invention,
this solution and design,
Stand up to all the hot and cold,
the solar winds malign
That blast and cook and penetrate
all objects in their way,
The zero-g, no gravity!
Galactic Cosmic Rays!

"And what about the vacuum?
To say nothing of the shocks
Of blasting off from terra firm,
the rattles, and the knocks
Of ripping through the atmosphere
at double-digit g's!
The shaking, baking punishment
that's just before the freeze!



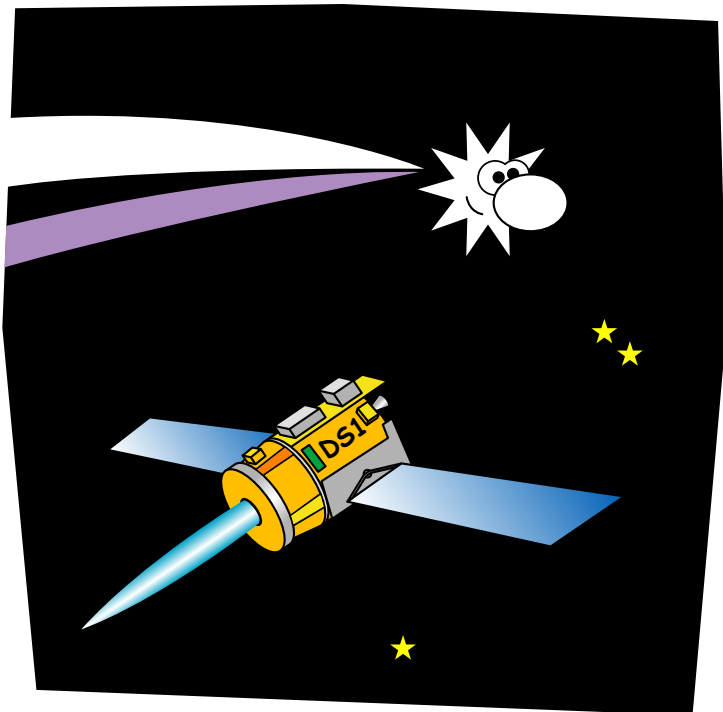
"The scientists don't want to risk
their research—just in case
The gadgets that do fine on Earth
Don't work too well in space.
They want their spacecraft rides well tried,
No doubts about their mettle."
So they count the costs, the pros and cons,
the benefits, then settle . . .

"An ion engine! That's the thing
that'll benefit the mostest,
It will keep on pushing, poking, nudging,
getting them the closest
To their destination.
To going on the cheap!
No matter what the spacecraft,
a technologic leap!



"Instead of blasting pounds of fuel
each time it needs to thrust,
And coasting all the other times,
the ion engine just
Never stops its gentle push, keeps on,
just like the tortoise,
But slowly, slowly going faster,
no atmosphere to thwart its

"Steady progress, steady climb
to speeds beyond the cruisers.
So little fuel, so little mass,
so many spacecraft users
Will want this drive!" So off they run
to test this innovation,
To find a spacecraft, plan the trip,
and pick some destinations.



To give the ion engine time and
space to show its stuff,
They have to send it far away,
and make its journey tough.
They name the mission Deep Space One,
because it must go far.
"We'll have it browse some asteroids,
a comet, then a star!"

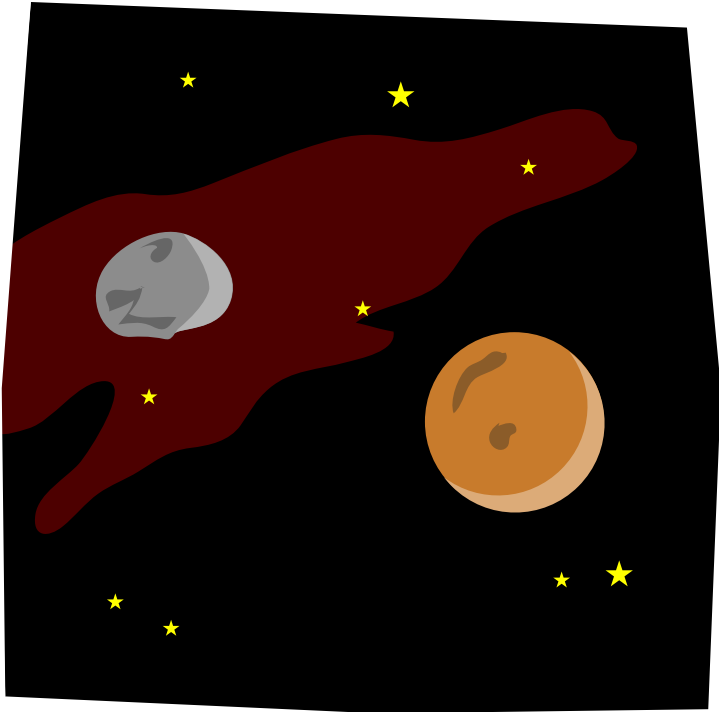
(Well, maybe not a star.)

So off it goes, a perfect launch.
It's ready for the test
They put the little spacecraft through.
They never would have guessed
It would do so well! The engine shines.
The engine gets an A!
And now the engine's ready.
It is proven. It's OK!



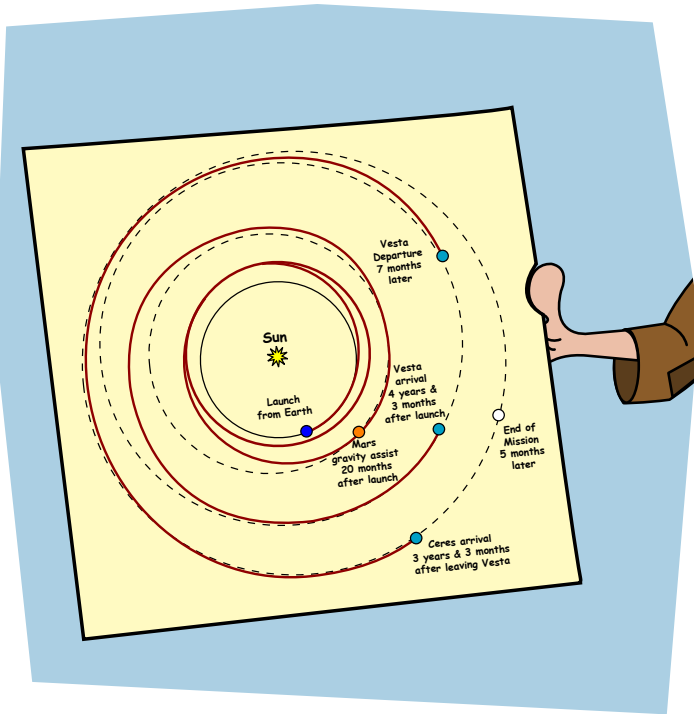
"The scientists and engineers
now have a way to make
Those really long trips to the moons
And comets overtake!
Or who knows *what* the sort of oddball
mission they can try?
With their thorough, careful plans,
convention they'll defy!"

Professor Starr jumps right to work.
He knows just what to do!
The mission to some asteroids
before now he'd pooh-poohed
Could now be done! They had a way!
With xenon ion thrust
This tiny engine, little gas,
could manage with a gust



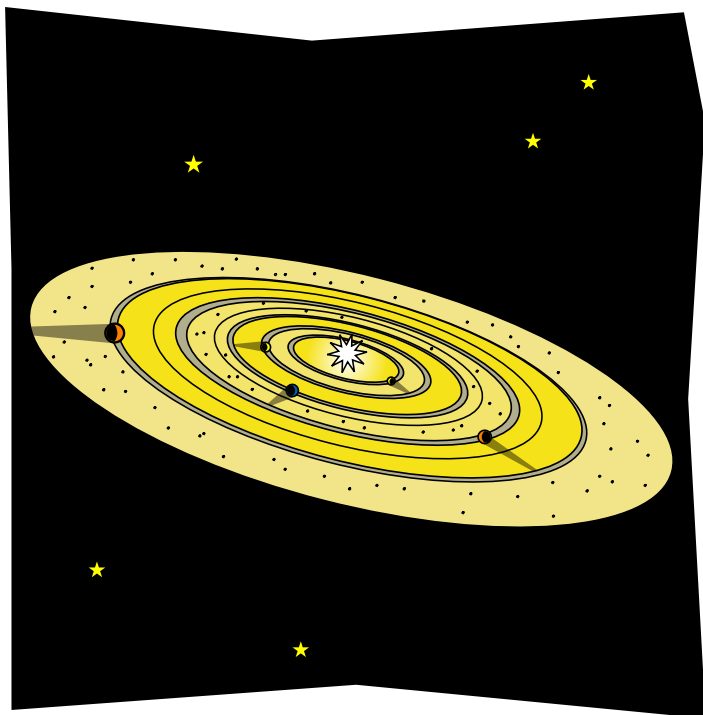
No bigger than a whisper,
what used to take a blast
With pounds and pounds of rocket fuel
combusting really fast.
"I've got a brilliant inspiration!"
he cries out to his grads.
"Now let's get down and work it out.
Go get your yellow pads!"

Two asteroids he has in mind are large,
yet not quite planets.
Their planet-building put on hold
when Jupiter began its
Weighty swings around the Sun.
No more accumulation
Of rocks and dust within the belt
of asteroids' location.



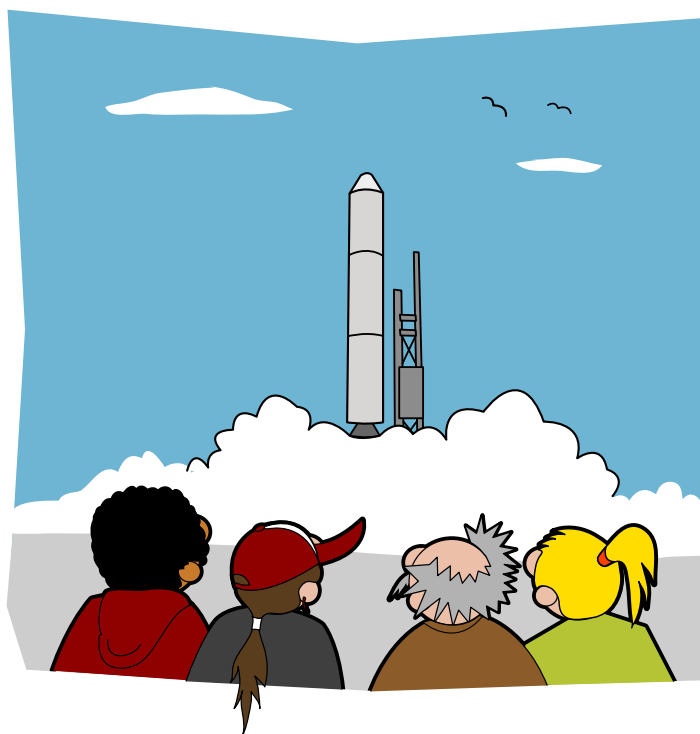
Vesta, Ceres are their names,
two most intriguing places.
One wet, one dry, both stuck in time,
both holding clues and traces
Of solar system's dawning moments,
planet evolution.
"We'll visit both! We'll stay awhile.
We'll get some resolution!

"With just a tiny spacecraft,
with just a splash of gas,
A double spiral 'round the Sun
will get us there at last!
We'll sneak up slowly, matching speeds.
We must do careful math!
Then gently tap our ion brakes,
let Vesta bend our path



"Til into orbit round we go.
We'll stay awhile and glean
Whate'er we can on lava flows,
basalt, and olivine.
We'll map the surface, light and dark,
and track the gravity field,
And no doubt find surprises,
as all our space trips yield!

"Then, after months of Vesta fun,
we'll still have oomph to spare.
We'll fire up our ion drive
and spiral out of there.
One (or nearly one) more swing
around the Sun will see
Us sneaking up on Ceres
for another science spree.



"Once again we'll plan our speed
so not to zip right past,
But just to be so gently caught
by gravity and cast
Into a gentle orbit 'round Ceres.
Then we'll map
This asteroid, the largest,
and its frosty polar caps.

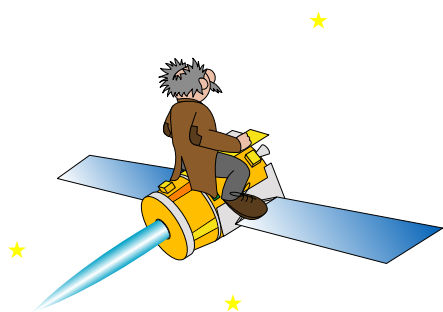
"What a mission! What a trip!
Never done before!
We'll call it Dawn to signify
its journey to explore
The dawning steps to planethood,
our solar system's start.
These mysteries, these mighty quests,
are closest to our heart."



And so it comes to pass that Dawn
is judged a worthy plan.
Technology has made it so,
has soundly bridged the span
From dreamy wish to solid fact,
to visions turned to gold.
New students of the stars now have
a way to plan more bold

Adventures using useful stuff,
devices guaranteed
Thanks to NASA's careful planning,
much by NMP,
Listening, weighing, choosing,
growing, testing, proving true.
"Just one last thing," says Starr, aglow,
"To NMP, thank you!"

THE END!



For more information, visit:

nmp.nasa.gov

spaceplace.nasa.gov

Or contact:

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