# KEPLER 3042

The year is 3042, and humanity is ready to explore the stars. Scientists have been studying the nearby celestial bodies for centuries, and they have identified the best candidates for human habitation. At long last, the nations of Earth have the technology to reach the stars. A peaceful competition has begun as they send their starships into the cosmos. In the end, all of humanity will win, but which nation will be remembered as the greatest pioneers?

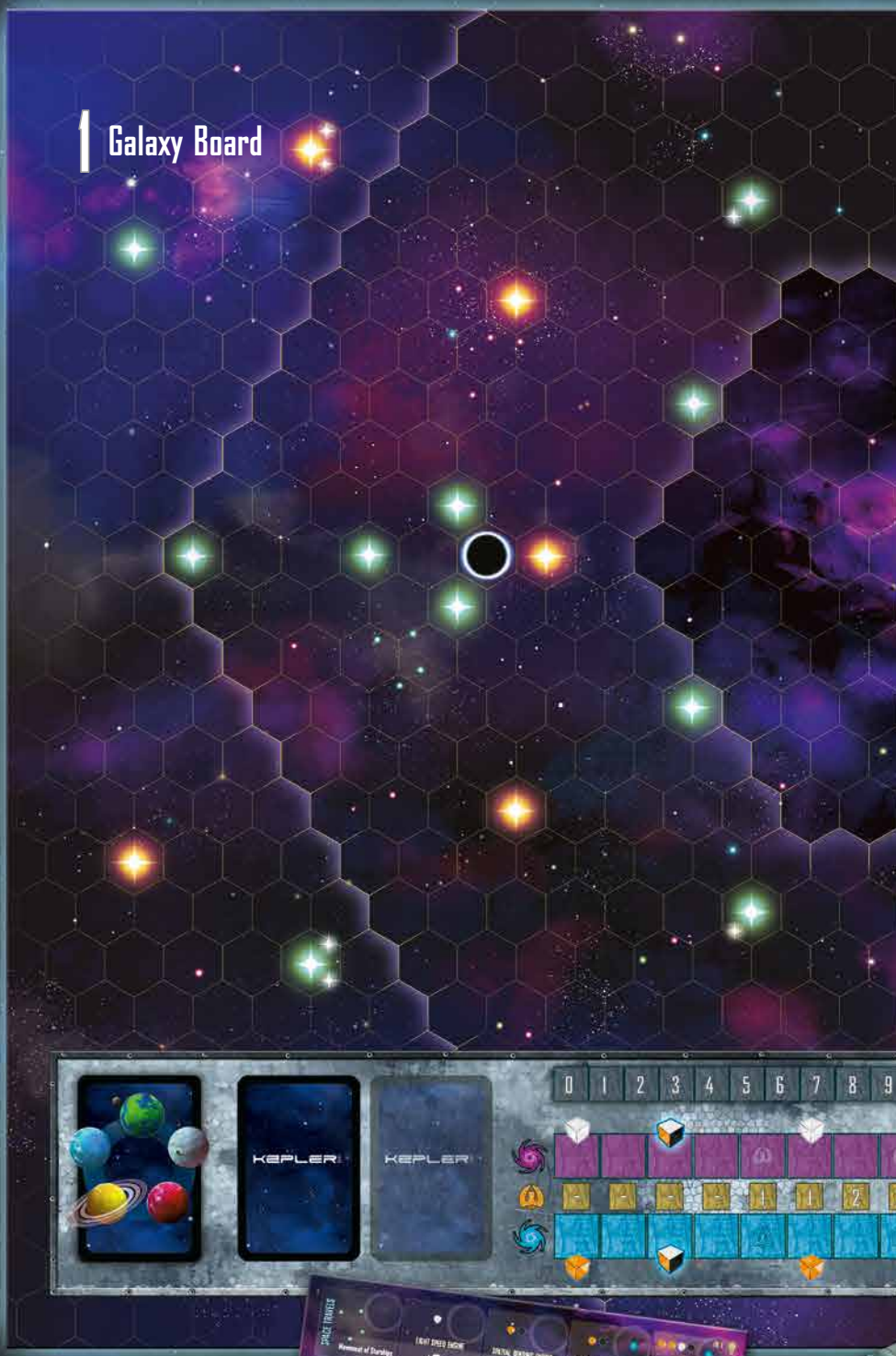
***Kepler-3042*** is a game of exploration and colonization. You must carefully manage your resources as you colonize, exploit, and terraform the planets of the Milky Way, developing critical technologies along the way. Each round, you choose which action to perform and which bonuses to activate to further your goals. The nation with the most victory points at the end will be remembered by history as the greatest explorers in the galaxy!

14+

1-4

60-120 min

# COMPONENTS



**1** Galaxy Board

**36** Celestial Body Tiles

- Oceanic Planet
- Rocky Planet
- Super-Earth
- Gas Giant
- Alien Planet
- Mine
- Colonial Target

**24** Medal Tokens

- 12 Colonial Medals
- 12 Technology Medals

**1** Round Marker

**1** First-Player Marker

**1** Scorepad

**4** Technology Boards

**4** Planet Summary Charts


**17** Objective Cards

10 Standard Objective Cards


7 Advanced Objective Cards


18 Progress Cards


Colony Side


Terraformed Side

28 Planet Cards


**4** Earth Cards



**4** Reference Cards (double sided)

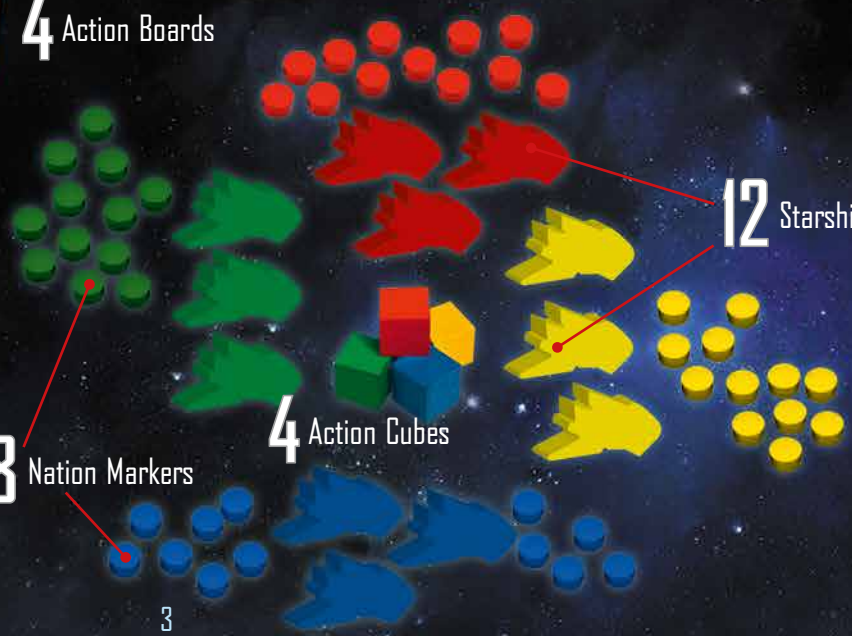

**4** Action Boards

**68** Resource Cubes

28 Energy (orange)

28 Matter (white)

12 Antimatter (black)



**12** Starships

**4** Action Cubes

**48** Nation Markers

# SETTING UP THE GAME

There are two parts of setup that must be completed before you are ready to play. Begin with the central setup, then afterward proceed with individual player setup (which each player carries out separately).

## CENTRAL SETUP

1. Place the galaxy board in the center of the playing area. Make sure you are familiar with its various printed features (see GALAXY BOARD - DETAILS on p. 6 for more information).

2. From among the 36 celestial body tiles, separate out the 28 planets. Consult a planet summary chart to determine which planets will be in play this game, based on player count:

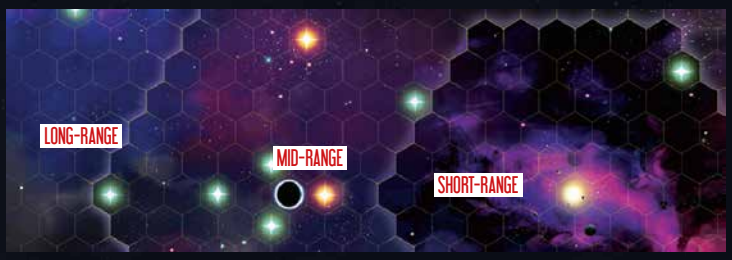
- In a 4-player game, use all the planets
- In a 3-player game, use 24 planets, removing those with the ☰ symbol
- In a 2-player game, use 20 planets, removing those with the ☰ and ☰ symbols

3. To the stack of planets you just created, add 1 mine and 1 colonial target per player. Shuffle all these tiles together, face down, then seed the galaxy board with them. Each tile must be adjacent to any star hex (except Sol), but must not be adjacent to any other celestial body.

- In a 4-player game, there are no other placement restrictions
- In a 3-player game, do not place any celestial bodies adjacent to trinary stars
- In a 2-player game, do not place any celestial bodies adjacent to binary or trinary stars

*Designer's Note: we tested this placement method a lot of times (really!) and found that it works best when done randomly, as described above. However, if you wish, you can distribute the tiles equally to the players, then take turns placing those tiles, one by one.*

4. Flip over all of the celestial bodies that were placed in the short-range zone of the galaxy. All celestial bodies in the mid-range zone and long-range zone should remain face down.




5. Place 10 medal tokens on the marked spaces of the galaxy board's technological leadership track and colonial leadership track — 5 medals per track. Set the other 14 medals aside for now.

6. Sort the 28 planet cards by number and place them in a deck on the corresponding slot of the galaxy board, with their colony sides face up. They should be stacked in ascending order (i.e., 1 on top, 28 on bottom).

7. Shuffle the 18 progress cards. Remove 2 at random and return them to the box without revealing them. Place the 16 remaining cards in a face-down deck on the corresponding slot of the galaxy board.

8. Decide which set of objective cards to use: standard or advanced. Shuffle the appropriate set of objective cards and deal 1 card to each player, face down. (Each player may look at their own card but should keep it hidden from their opponents.) Return the unused objective cards to the box without revealing them.


9. 

Place the round marker on the 0 space of the galaxy board's round track.

10. 

The player who most recently read an article about astronomy is named the first player, taking the first-player marker.

## INDIVIDUAL PLAYER SETUP

1. Take a full set of player pieces: 12 nation markers, 1 action cube, 1 action board, 3 starships, 1 technology board, 1 planet summary chart, 1 Earth card, and 1 reference card. In addition, take the following resources: 7 energy, 7 matter, and 3 antimatter.

2. Place 1 of your nation markers on the starting space (i.e., leftmost) of each of the 5 rows of your technology board.

3. Place 1 of your nation markers on the starting level of both the technological leadership track and the colonial leadership track.


Keep your 5 remaining nation markers close by — you will need them later on.

4. After consulting the secret objective card you were dealt, advance 2 of your nation markers one level each on your technology board, ignoring all printed costs. You must advance 2 different markers (i.e., you cannot advance the same marker twice).


5. Position your Earth card in front of you. Place 3 matter and 3 energy on your Earth card. Place all of your remaining resources (4 energy, 4 matter, 3 antimatter) in the resource storage area of your action board.


6. Move your action cube to the Terraforming space of your action board (i.e., in the center).


7. Keep your planet summary chart and double-sided reference card at hand so that you can refer to them during the game. You are now ready to play!

# GALAXY BOARD - DETAILS

This board represents our galaxy, the Milky Way. The main part of the board is composed of hexes. There are 396 empty space hexes. The other hexes all represent specific features: 20 star hexes, the Sol hex (yellow), and the Sagittarius A* hex (black).

The galaxy is divided into three zones, which emanate outward from the Sol hex: the short-range zone, the mid-range zone, and the long-range zone. The boundaries of each zone are indicated by the white lines.

In the lower left corner of the board, there are designated slots for the planet deck and the progress deck, as well as a slot for the progress card that will be flipped face up each round.


Three tracks take up most of the bottom of the board. These three tracks are the round track (numbered 1-16), the colonial leadership track (purple), and the technological leadership track (blue). Along the outer edges of the leadership tracks are icons that indicate bonus resources players can gain when their nation markers reach the associated spaces.

Between the two leadership tracks are numbered spaces that indicate how many VPs the players will gain at the end of the game, based on the position of their nation markers on those tracks.

# GAME TERMINOLOGY

As you read the rules and play the game, make sure you understand how these important game terms are defined.

**Burn:** To burn a resource means to take a resource (either from your resource storage or from one of your planet cards) and move it to the Clausius Pit on your action board. Burned resources are not available to be produced or spent unless you regenerate them.

**Celestial Body:** This is a universal term for any of the tiles placed face down on the board during setup, which players can discover. Planets, mines, and colonial targets are all considered celestial bodies, while other galactic features (i.e., stars, Sol, Sagittarius A*) are not.

**Clausius Pit:** The area at the top right of your action board. Resources are moved here when they are burned. Any resources in this area cannot be produced or spent, but they can be regenerated.

**Colonial Target:** A celestial body that can be passed over by a starship. When this happens, that player earns 1 , and then the colonial target is removed from the game. In each game, there is always a number of colonial targets equal to the number of players.

**Mine:** A celestial body that cannot be colonized or terraformed, but that is rich with resources. Each starship located on a mine at game's end yields 2 VPs. In each game, there is always a number of mines equal to the number of players.

**Planet:** A celestial body that you can colonize, terraform, and produce resources on. Planets come in five types: oceanic planets, rocky planets,

super-Earths, gas giants, and alien planets. Each planet is represented by both a tile on the galaxy board and a corresponding card in the planet deck. Your Earth card is treated as a planet, except that it is already colonized and terraformed at the beginning of the game (of course!).

**Produce:** To produce a resource means to take a resource from resource storage on your action board and place it on any one planet card that you control. When you produce multiple resources at once, the produced resources must all go to a single planet.

**Regenerate:** To regenerate a resource means to take a resource from the Clausius Pit on your action board and return it to your resource storage. Regenerated resources are once again available to be produced and spent.

**Resource:** Generic term that refers to the three types of resource cubes: energy, matter, and antimatter. Resources can be produced, spent, burned, and regenerated. You will need resources to accomplish most tasks in the game, such as building starships, terraforming planets, advancing technologies, and performing bonus actions.

**Resource Storage:** The area at the bottom left of your action board. Your available resources are stored here until they are produced (and moved to a planet card) or burned (and moved to the Clausius Pit). Resources in your resource storage cannot be spent.

**Space Hex:** Most of the galaxy board is made up of empty space hexes. Your starships can freely move through these areas of the galaxy. Some of the space hexes of the galaxy board are covered by celestial bodies during setup; these are no longer considered empty space hexes.

**Spend:** To spend a resource means to take a resource from one of your planet cards and return it to your resource storage. When you spend multiple resources at once, the spent resources must all come from a single planet.

**Zone:** There are three zones on the galaxy board, divided by white lines, that emanate outward from the Sol hex. Certain objectives require colonizing planets in specific zones, and players earn more VPs for colonizing planets in the further zones.

# HOW TO PLAY

*Kepler-3042* is played over 16 rounds. Each round is divided into three phases, which must be completed in order:

1. Reveal Progress Card
2. Player Turns
3. Cleanup

## PHASE 1: REVEAL PROGRESS CARD

At the beginning of each round, the current first player turns over the top card of the progress deck and reads it aloud. The effect listed on the card will take place at the end of the round (during the Cleanup phase), so players have the entire round to prepare for it. Advance the round marker one space on the round track.


*Example A: Giulia is the first player, so she draws the top card of the progress deck and reads it, before placing it face up next to the deck. The card is Extraterrestrial Knowledge: at the end of the round, each player will have an opportunity to advance a technology by one level for free, though possibly burning resources in the process.*

## PHASE 2: PLAYER TURNS

In this phase, each player gets one turn, beginning with the current first player and continuing in clockwise order. Each player's turn is split into four steps, which must be performed in order:

2a. Main Action
2b. Bonus Actions
2c. Move Starships
2d. Withdraw Starships

### 2a. Main Action

In this step, you must move your action cube to any other space on your action board, then take the associated action. Moving your action cube is mandatory, but you are never required to take the action. See pages 8-10 for descriptions of the nine main actions.

## Space Missions

You may build up to three starships, if you have them available. To build a starship, spend one energy and one matter from one planet you control, then place the starship in a space hex next to that planet. (If you spend the resources from your Earth card, your newly built starship must be placed adjacent to the Sol hex instead.)

In the unlikely event that all the space hexes around the planet are impassable or occupied by other starships, your newly built starship must be placed in the nearest empty space hex.


*Example B: Amani chooses the Space Missions action. He spends one energy and one matter from his Earth card and one energy and one matter from the Planet 19 card. Amani then puts two starships on the galaxy board, placing them on hexes adjacent to the planets he spent the resources from (Earth and Planet 19).*

## Colony Seeding

You may remove any number of your starships that are on planets, replacing them with your nation markers. For each planet colonized this way, take the corresponding card from the planet deck and place it in front of you with the colony side up, then immediately earn the shown, advancing your nation marker on the colonial leadership track accordingly.

Colonizing planets does not require spending resources. However, you cannot colonize alien planets until you have reached the Alien Colonies level of the V-Antimatter Science technology.


*Example C: Louise chooses the Colony Seeding action. She has starships on Planet 22 (a gas giant) and Planet 26 (an alien planet) and she has reached the Metamaterial Generator level, which allows her to set Alien Colonies.*


*Louise removes her starships from those two planets and takes the corresponding cards from the planet deck. In so doing, Louise earns 3 , advancing her nation marker three spaces on the colonial leadership track.*

## Technological Development

You may advance one or more technologies on your technology board. For each advancement, you must spend the indicated resources, then advance your nation marker. All the resources for an advancement must be spent from a single planet.

Some technology levels will earn you when you reach them, advancing your nation marker on the technological leadership track. Any abilities granted by your new technology level are available immediately.


*Example D: Filip takes the Technological Development action. He advances his V-Antimatter Science technology level from level 0 to level 1 by spending one energy. In the same action, he decides to advance V-Antimatter Science again, from level 1 to level 2, by spending two energy and one antimatter. Filip earns 1 for this second advancement.*


*Example E: Giulia chooses the Terraforming action. She has reached the Planetary Engineering level of IV-Terraforming technology, so she can terraform level-1 and level-2 planets. Planet 2 is level 1 and has a terraform cost of one energy, while Planet 5 is level 2 and has a terraform cost of one energy and one matter. Giulia spends one energy from Planet 2 and one energy and one matter from Planet 5, and flips those planet cards to their terraformed side. She earns 3 total (1 from Planet 2 and 2 from Planet 5).*

## Stellar Propulsion

You may immediately move each of your starships, following all normal rules for starship movement (see 2c. Move Starships on p. 11). You will be able to move your starships again during the next step of your turn, as normal.

## Terraforming

You may terraform one or more planets you control by spending the required resources (indicated on each planet card) and flipping the cards to their terraformed side. All of the resources required to terraform a planet must be spent from that planet. (If there are resources left on a planet after paying the terraform cost, they remain — put them back on the planet card after flipping it over.)

In order to terraform a planet, you must have reached at least the minimum level of IV-Terraforming technology listed on that planet card.

When you terraform a planet, you immediately earn any listed on the terraformed side of the planet card, advancing your nation marker on the colonial leadership track accordingly.

## Galactic Mapping

Advance your nation marker one space on either of the leadership tracks. Then, flip over any four face-down celestial bodies, one at a time, revealing them permanently.

*Example F: Amani chooses the Galactic Mapping action. First, he advances his nation marker one space on the technological leadership track. He then chooses four face-down celestial bodies and flips them over, hoping to find something that will assist in his goals. The revealed celestial bodies are Planet 4, Planet 25, a mine, and a colonial target.*

## Energy Storage

You may produce the amount of energy allowed by the current level of your III-Energy Development technology. All the energy produced this way must be placed on any one planet that you control.


*Example G: Louise chooses the Energy Storage action. She has reached the Plasma Quantum Central level of the III-Energy Development technology, so she produces four energy on a planet of her choice. She chooses Planet 5. However, she only has three energy in her resource storage, so she moves only those three energy to Planet 5.*

## Planetary Exploitation

You may produce resources on planets that you control. The number of planets that can produce is indicated by the level of your IV-Terraforming technology. (This means that if your IV-Terraforming technology is at level 0, you cannot produce on any planet.)

For each planet that produces, take the indicated resources (shown at the top of the planet card) from your resource storage and place them on that planet card. If you do not have enough resources in your resource storage, you can only produce what you have available.


*Example H: Filip chooses the Planetary Exploitation action. He has three planet cards besides his Earth card. He has reached level 3 in IV-Terraforming technology, so he can produce on any two of those three planets. He chooses Planet 21 (producing one energy and two matter) and Planet 22 (producing one energy and three matter).*

## Antimatter Generation

You may produce the amount of antimatter allowed by the current level of your V-Antimatter Science technology. All the antimatter produced this way must be placed on any one planet that you control.


*Example I: Giulia choose the Antimatter Generation action. She has reached the Metamaterial Generator level of V-Antimatter Science technology, so she produces two antimatter. Giulia chooses Earth as the planet to produce, and she places two antimatter on her Earth card.*

## 2b. Bonus Actions

In this step, you may take one or two bonus actions. Each type of bonus action is associated with a row or column on your action board. (See p. 11 for descriptions of the six bonus actions.)

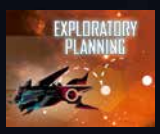
The bonus actions that are available to you on any given turn are determined by the location of your action cube. You may take the bonus action for the row and/or column that your action cube is in, but you cannot take the same bonus action twice in a turn.


**Space Logistics:** Build one starship without spending any resources, placing it in a space hex next to any planet you control.


**Evolution of Technology:** Produce one antimatter on any planet you control.


**Scientific Progress:** Advance your nation marker one space on the technological leadership track.


**Civil Modernity:** Advance your nation marker one space on the colonial leadership track.




**Exploratory Planning:** Immediately move your starships up to two spaces each, following the normal rules for starship movement.


**Exploitation of NEO:** Produce one energy and one matter on your Earth card.

In order to take a bonus action, you must burn one resource of your choice. If you choose to take both bonus actions, you can take them in any order, but must burn two resources.


*Example J: Amani took the Space Missions action earlier in his turn. That means the bonus actions available to him are Space Logistics and Civil Modernity. He burns 1 energy (from a planet card) to activate Space Logistics, then burns 1 matter (from resource storage) to activate Civil Modernity.*

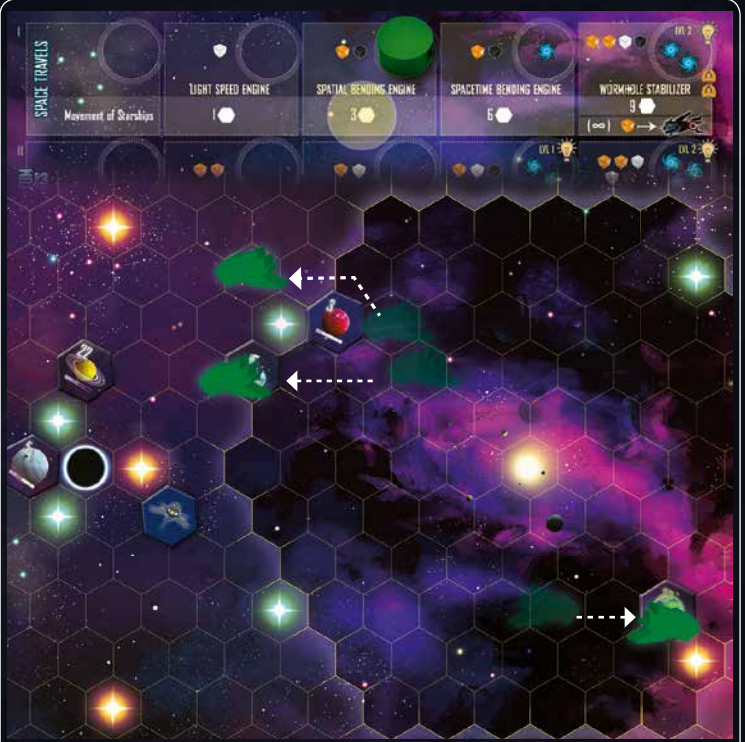
Remember that resources in your Clausius Pit cannot be used in any way as long as they remain there! There are a few ways to regenerate resources, but they are fairly rare. Always think carefully before taking bonus actions!

## 2c. Move Starships

In this step, you may move your starships that are in empty space hexes. (Starships that are on celestial bodies cannot move.) Each of your starships can move a number of spaces up to your maximum speed, which is determined by the current level of your I-Space Travels technology.

If your starship moves onto a planet or mine, it must stop moving; it is no longer able to move, but you can return it to your supply later by withdrawing it or — in the case of a planet — by colonizing that planet.

If your starship moves onto a colonial target, immediately remove the colonial target from the game and earn 1 , advancing your nation marker on the colonial leadership track accordingly. Your starship can now continue its movement, if it has any left.




*Example K: Louise has reached the Spatial Bending Engine level of the I-Space Travels technology, so the maximum speed for her starships is three. She moves one of her starships to Planet 27 and another starship to a nearby mine. Her third starship continues its trip toward the long-range zone of the galaxy.*

Some of the hexes on the galaxy board are impassable. Starships can never enter any of these spaces: the Sol hex, Sagittarius A*, any unrevealed celestial bodies, and all star hexes. (The six empty space hexes around Sol are passable, as normal.)

Your starship can move through an empty space hex that is occupied by another starship, but cannot end its movement there. However, your starship cannot move onto or through any celestial body that is already occupied by a starship or nation marker, even if your own.

## 2d. Withdraw Starships

In this step, you may choose to withdraw any of your starships that you wish, removing them from the galaxy board and returning them to your supply. If you withdraw a starship from a mine, you may immediately regenerate one resource.


*Example L: Filip moved one of his starships onto a mine earlier on his turn, and now decides to withdraw that starship, removing it from the galaxy board. This allows him to regenerate one matter, which he moves from his Clausius Pit to his resource storage.*

Playing Hint: You will not usually withdraw a starship that is not on a mine. Occasionally you may find that you really need a starship somewhere else next round, but you don't have any available. This is an inefficient use of resources, though, so try to avoid it!

## PHASE 3: CLEANUP

After all players have taken their individual turns, the cleanup phase involves three simple steps to take before you move on to the next round:

**3a. Resolve Progress Card**
**3b. Award Medals**
**3c. Change First Player**

### 3a. Resolve Progress Card

In this step, the progress card which was at the start of the round takes effect. Follow the instructions on the card, which usually involves a benefit for the player who is highest or lowest on one of the leadership tracks.

In the case of a tie, all tied players receive the benefit. When this happens, the tied players receive their benefits one at a time, in turn order.

### 3b. Award Medals

In this step, any medals that accumulated on the revealed progress card during the round are awarded. The player whose nation marker is highest on the colonial leadership track collects all the colonial medals from the card, while the player whose nation marker is highest on the on the technological leadership track collects all the technology medals from the card.

If there is a tie on either track for highest nation marker, all the tied players collect the full number of medals they should receive — use the extra medals that were set aside during setup to make up the difference.


*Example M: There are two technology medals and one colonial medal on the revealed progress card. Giulia is highest on the colonial leadership track, so she collects the colonial medal. Amani and Louise are tied for highest on the technological leadership track, so they each collect two technology medals (taking the two extra from the supply).*

### 3c. Change First Player

The player with the first-player marker passes it to the player on their right. That player will be the new first player in the following round. (If this is the 16th round, skip this step and proceed directly to END OF THE GAME.)

## END OF THE GAME

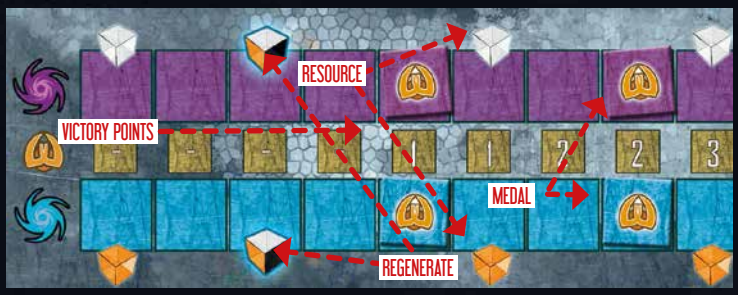
The game ends after the 16th round has been fully completed. Then all players' scores are tallied on the included scorepad, using the scoring system below:

- 1 VP for each antimatter remaining on your planets
- 5 VPs if you have colonized at least one planet of every type (rocky planet, oceanic planet, super Earth, gas giant, and alien planet)
- 3 VPs if you have colonized at least three planets of a single type
- 2 VPs for each of your starships located on a mine
- 2 VPs for each technology you have advanced to the maximum level
- 1 VP for each leadership medal you have collected
- VPs for the planets you have colonized: 1 VP for each planet in the short-range zone, 2 VPs for each planet in the mid-range zone, 3 VPs for each planet in the long-range zone
- VPs for the location of your nation marker on each of the leadership tracks
- VPs for your terraformed planets (as indicated on those planet cards)
- VPs for completing your secret objective (indicated on the objective card)

The player with the highest VP total wins the game! If there is a tie, the winner is the tied player who has terraformed the planet with the highest number.

# LEADERSHIP TRACK BONUSES - DETAILS

There are certain bonuses available to you when your nation marker reaches or passes specific spaces on the leadership tracks:




- If your marker reaches or passes a space with the icon, you may immediately regenerate one resource of your choice.

- If your marker reaches or passes a space with the or icon, you may immediately produce one resource of the indicated type on any one planet that you control.

- If your marker reaches or passes a space with a medal on it, you must immediately place that medal on the revealed progress card.


*Example N: Amani just earned two , so he advances his nation marker two spaces on the technological leadership track, passing a space with the icon. This allows him to produce one energy, which he places on his Earth card.*

# TECHNOLOGIES - DETAILS

During the game, you can invest in five different technologies. Each technology has five progressive levels. New levels must be acquired in the order (left to right) that they are listed on your technology board.

Once you acquire a level, you gain its benefits immediately, including any printed in the space to which you just moved your nation marker.

## COLLABORATION BONUSES

Whenever any player acquires a technology level with the icon, other players may benefit: every player who has not acquired the indicated level for that technology immediately acquires it for free, advancing their nation marker accordingly.


*Example O: Louise has just acquired the Alien Genetic Research technology (level 3), which unlocks the Biosphere technology (level 1) for all other players. Filip had not acquired it yet, so he immediately advances his nation marker to the Biosphere level. Giulia and Amani have already acquired Biosphere technology, so they do not benefit from this.*

## TECHNOLOGICAL BENEFITS

### I - Space Travels

This technology determines how many spaces your starships can move each turn, either during step 2c. Move Starships or via the Stellar Propulsion main action.

If you reach the Wormhole Stabilizer level of this technology, you can build starships by spending only one energy each, instead of one energy and one matter.

### II - Quantum Physics

This technology offers two primary benefits: resource conversion and resource allocation. These benefits can be used at any point during your turn, even in the middle of an action. There is no cost for using them.

Resource Conversion: This benefit allows you to convert one energy to one matter, or vice versa. When you use this benefit, swap the resource from any planet that you control for the other resource from your resource storage. If you reach the Relativity Domain level of this technology, you can make an unlimited number of conversions each turn.

Resource Allocation: This benefit allows you to move a number of resources around among your planets, taking them from some planets and placing them

directly on other planets. The number of resources you can move each turn increases with each successive level of this technology that you acquire.

### III - Energy Development

This technology determines the number of energy you produce when you take the Energy Storage main action.

If you acquire the Theory of Everything level of this technology, for the rest of the game you only have to burn one resource (instead of the usual two) to activate both of the bonus actions available to you on your turn.

### IV - Terraforming

This technology determines how many planets will produce resources when you use the Planetary Exploitation main action.

The gradient bar (which has four progressive levels) indicates which planets you are able to terraform, according to their levels. Consult your planet summary chart to see at a glance the minimum required level for each planet.

### V - Antimatter Science

This technology determines the number of antimatter you produce when you take the Antimatter Generation main action.

If you acquire the Metamaterial Generator level of this technology, you will be able to colonize alien planets. Otherwise, you cannot do so.

**The planets represented in the game have been discovered by these valiant scientists:**

| | |
|---|---|
| AP-780427 | discovered by Andrea Pomelli |
| RV-351016 | discovered by Rebecca Varah |
| DG-690613 | discovered by Domenico Gamboni |
| SS-591217 | discovered by Sevy Singh |
| GR-830512 | discovered by Gabriele Radaelli |
| FM-790806 | discovered by Flavio Marchetto |
| SK-671102 | discovered by Shyam Kumar |
| FM-820526 | discovered by Frederik Michel |
| FB-130920 | discovered by Ferris Bueller |
| GES-040117 | discovered by Grant Evan Samsel |
| KMS-710430 | discovered by Kyle Matthew Schweighauser |
| KG-711110 | discovered by Kevin Glenn |
| MK-870430 | discovered by Mike Kemp |
| AMV-911109 | discovered by Alejandro Martinez-Valero |
| JK-840206 | discovered by Joseph Kovach |
| DA-700814 | discovered by Deborah Arndell |
| BJB-770617 | discovered by Brian J Bargmeyer |
| UV-700725 | discovered by Uffe Vind |
| DB-900412 | discovered by Diletta Bergantin |
| SM-851029 | discovered by Sara Marcon |
| AV-750413 | discovered by Andrea Vassallo |
| FO-850813 | discovered by Fabrizio Oliveto |
| FD-841112 | discovered by Francesca Dicati |
| GDG-640811 | discovered by Giuseppe Di Giovanni |
| SD-150723 | discovered by Sabina Derdziak |
| ACS-160526 | discovered by Alessandro Cerruti Sola |
| VM-801016 | discovered by Valentina Marcon |
| SCS-800219 | discovered by Simone Cerruti Sola |

## RULES FOR SOLITAIRE PLAY

***Kepler-3042***'s solo mode is set up as a campaign, which is a series of four games (also known as levels) of escalating difficulty. When you finish the first level of your campaign, if you were successful, you move immediately to the next level. If you were unsuccessful, restart that level. In this way, the campaign will take you no less than four games, but likely more than that.

There are five different campaigns to choose from. They all follow the exact same rules outlined in this section on solitaire play, but they differ in their difficulty.

### CHANGES TO SETUP

1. Prepare the galaxy board by seeding it with celestial bodies as though it were a two-player game (i.e., 18 planets, 2 mines, 2 colonial targets). Do not place any celestial bodies adjacent to binary or trinary stars.

2. Remove from the game the progress card labeled "Agreement on Expansion." Also remove a second progress card at random, without revealing it. Then shuffle as normal.

3. Place your starting resources (7 energy, 7 matter, 3 antimatter) in the resource storage area of your action board; do not put any of these starting resources on your Earth card.

4. Place any bonus resources available to you directly on your Earth card. (See BONUS RESOURCES for details.)

5. Set a second technology board nearby; this belongs to the ghost player. Place five of the ghost player's nation markers on the starting levels of this technology board.

6. Place one of your nation markers on the starting space of each leadership track, as normal. Then do the same for the ghost player.

7. Place the ghost player's three remaining nation markers on the 5, 10, and 15 spaces of the round track.

8. Take the objective cards needed for the current

level of your chosen campaign. (See CAMPAIGN STRUCTURE for details.)

9. After consulting your objectives, advance two of your nation markers one level each on your technology board. Then advance the ghost player's nation markers one level each in the three technologies that you did not advance.

## BONUS RESOURCES

At the start of each new level in your campaign, you gain bonus resources, in addition to your normal starting resources. These bonus resources are placed directly on your Earth card.

- Level 1: no bonus resources
- Level 2: gain 1 energy or matter (your choice) for every 5 VPs that you scored over the minimum required score in the previous level + 1 antimatter
- Level 3: gain 1 energy or matter (your choice) for every 5 VPs that you scored over the minimum required score in the previous level + 2 antimatter
- Level 4: gain 1 energy or matter (your choice) for every 5 VPs that you scored over the minimum required score in the previous level + 3 antimatter

*Example P: Giulia just successfully completed level 2 of her current campaign with a score of 57 VPs, which is 17 more than the minimum required score of 40. Therefore, she will begin level 3 with bonus resources of 3 energy or matter — in any combination — and 2 antimatter, all on her Earth card.*

## COMPLETING LEVELS

To complete a level, you must complete the objective for that level and the objectives for all previous levels by the end of the game's 16th round. You can complete the required objectives in any order; it is also possible to complete multiple objectives at once. You score VPs for completing objectives, as normal.

*Example Q: To successfully finish level 3 in **The Edge of the Galaxy** campaign, Giulia must complete the following three objectives: External Logistics Base, Atlantis Project, and Helios Project. She terraforms an oceanic planet early on, completing the Atlantis Project objective. Later, she discovers a rocky planet in the long-range zone and terraforms it, completing the Helios Project and External Logistics Base objectives simultaneously.*

In addition, you must reach a minimum required score by the end of the game. The minimum required scores per level, indicated below, are the same across all campaigns.

- Level 1: 30 VPs
- Level 2: 40 VPs
- Level 3: 50 VPs
- Level 4: 60 VPs

If you complete the required objectives, but do not reach the minimum required score by the end of the game (or vice versa), then you have not successfully completed the level and will need to attempt the same level again in your next game.

## CHANGES TO GAMEPLAY

At the beginning of each round, advance the ghost's nation markers one space on each leadership track. Medals are activated (i.e., placed on the progress card) normally when reached, and they can be collected by the ghost player.

When the round marker reaches one of the spaces with the ghost player's nation marker (i.e., rounds 5, 10, and 15), advance all of the ghost player's nation markers one level in each technology. The ghost player does not affect (and is not affected by) collaboration bonuses.

The ghost player's nation markers do not advance in any other way. Their positions, and the medals collected by the ghost player, only exist as a way to potentially keep you from gaining the benefits of the progress cards.

## CAMPAIGN STRUCTURE

**The Edge of the Galaxy (easy)**
Level 1 Objective: External Logistics Base
Level 2 Objective: Atlantis Project
Level 3 Objective: Helios Project
Level 4 Objective: Titan Project

**Sons of Progress (medium)**
Level 1 Objective: Elite Scientific Branch
Level 2 Objective: Antimatter Mastery
Level 3 Objective: Extraterrestrial Contact
Level 4 Objective: Technological Supremacy

**Sagittarius A* (hard)**
Level 1 Objective: Logistic Support
Level 2 Objective: Internal Logistics
Level 3 Objective: Eden Project
Level 4 Objective: External Logistics

**Hybrid Civilization (extreme)**
Level 1 Objective: Extraterrestrial Study
Level 2 Objective: Colonial Plan
Level 3 Objective: Gemini Program
Level 4 Objective: Civil Expansion

**Superior Progeny (utopian)**
Level 1 Objective: Colonial Supremacy
Level 2 Objective: Colonial Plan
Level 3 Objective: Technological Supremacy
Level 4 Objective: Internal Logistics

## FREQUENTLY MISSED RULES

- You must move your action cube each turn; you cannot take the same action twice in a row.
- To colonize a planet, you don't need to spend any resources.
- You must acquire the Metamaterial Generator level of the V-Antimatter Science technology before you can colonize alien planets.
- To terraform a planet, you must spend the required resources from the planet card.
- To build a starship and place it next to a planet via the Space Missions main action, you must spend the required resources from that planet card.
- To build a starship via the Space Logistics bonus action, you don't need to spend any resources (but you have to burn a resource to take the bonus action), and you can place the starship next to any of your planets.
- If your starship moves onto a planet or a mine, it stops there and cannot move again (though you can remove it by withdrawing it or colonizing the planet). If you want to move your starship past a celestial body, you must travel around it.
- Face-down celestial bodies, or those where there is a starship or nation marker, are impassable for starships (even if the occupying starship or nation marker is your own).
- The collaboration bonuses do not automatically grant an extra technology level to your opponents; it only allows them to acquire the indicated level (1 or 2). A player who has already acquired the indicated level does not benefit from the collaboration bonus.
- You must keep your objective card secret until the end of the game; do not reveal it as soon as you accomplish it.
- The benefits (moving and converting resources) granted by the II-Quantum Physics technology can be used at any time during your turn.

## CREDITS

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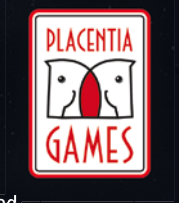
Special Thanks:
The game designer would like to thank: Valentina, my ally since forever. Arianka the "mother" and Garet the "father" who founded the Guerrieri Valsesiani Gaming Club. All the playtesters, with a special mention to Diletta and Elia for their important support. I dedicate this game to you, mother, the burning star in my soul.
Renegade Game Studios would like to thank: Rook's Comics and Games, Luke Duncan, Lincoln Erickson, Ed Kern, Luca Allaria, Cory Kelly, Judy Tolliver, and Phil DeKoning.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*Example R: Louise has Planets 18 and 19 and has three energy and three matter in her resource storage. She takes the Planetary Exploitation action and produces one energy and two matter on Planet 18, then converts one of the two matter she just produced into energy so that she can complete the action and produce one energy and two matter on Planet 19 also.*

# The Science in KEPLER 3042

Written by Adrian Fartade | Translated by Andrea Pomelli | Edited by Dustin Schwartz

We'll offer you some clarifications about the scientific aspects of the game. We hope you will appreciate our work and our love for science!

## TERRAFORMING

Terraforming is the term used for a series of changes to a celestial body's processes designed to make it more similar to Earth and to allow life like to exist there in Earth-like conditions. It is in opposition to the idea of changing ourselves to withstand other types of environments.

Celestial bodies that can be terraformed are primarily rocky worlds, like the inner planets of the solar system, especially Mars or perhaps Venus. Even Mercury and the Moon are potential targets, but the added difficulty with these bodies means it would be more advantageous to simply create bubbles or whole cities sealed underground.

Besides Earth, the ideal target for human habitation is Mars. It does not resemble the Earth now because its atmosphere isn't thick enough for water to remain in a liquid state. There are other challenges, too: the temperatures are extremely low, there isn't good protection against radiation, and it's impossible to grow crops. However, we could intervene by melting the ice on Mars in order to create a thicker atmosphere. This would make the planet hotter and provide better protection against radiation, and the resulting higher pressures would allow the presence of rivers and lakes. We could genetically modify organisms to live on Mars and consume iron oxide and carbon dioxide while emitting oxygen for us to breathe.

We could even bring leading industries to derive nitrogen and other minor components, and we would soon have an atmosphere similar to that of Earth. Algae and fungi would begin to prosper, dominating the planet. From there, we could develop small plants and then trees, insects, and animals — all genetically modified to survive in these very different conditions.

It would not be possible to terraform gas giants, but we could attempt to terraform their moons, as imagined in James Cameron's *Avatar*. We could create floating colonies that use the atmosphere's hydrogen for energy and travel by the winds. Gas giants could be a source of helium-3, used by nuclear fusion engines to power larger nacelles, even those with enough energy to feed antimatter engines. In the end, gas giants may prove useful, but not as direct terraforming targets.

## EXPLOITATION OF NEOs


In the game, you cannot perform the Planetary Exploitation action on Earth, because it would be absurd and short-sighted to rob our own mother planet of resources. Exploitation of NEOs is a term for the process of extracting resources from near-Earth objects, or NEOs (i.e., celestial bodies that pass near Earth, like asteroids).

We presume that in the very near future we'll have the technology to move asteroids where we want, rather than waiting for them to travel close to Earth, thus expediting the process of exploiting them for resources. NASA's Asteroid Redirect Mission will lay the groundwork for this, placing a piece of asteroid in a stable orbit around the Moon to allow for easier analysis.

In any case, when humanity masters the technological tools to make trips such as those imagined in the game, those tools will also permit us to conveniently take advantage of the various resources within the solar system.

## MINES

In the game, mines represent the remnants left after a star's explosion. When stars explode, the objects left behind can be supernova remnants, white dwarfs, neutron stars, pulsars, or magnetars. Among these remnants, there are fragments of planets that we will someday be able to exploit for matter. The intense radiation emitted by these objects also makes them primary sources for mining both energy and antimatter.

## CLAUSIUS PIT


IIn reality, there is no such thing as the Clausius Pit. Within the scope of the game, it is imagined that resources in this area are no longer usable because of thermodynamic transformations, due to entropy. For this reason, this part of the game has been dedicated to and named after scientist Rudolf Clausius, who first introduced the concept of entropy in 1865.

## ANTIMATTER

Antimatter is equal to matter but has an opposite sign. So while in matter a proton is positive, in antimatter it is negative. Similarly, negative electrons becomes positive positrons, and so on. When matter and antimatter meet, they annihilate each other instantaneously, which means that their entire mass is converted into pure energy.

Alas, this phenomenon is not much help for today's scientists, because producing antimatter requires a huge expenditure of energy. Antimatter is rarely produced by natural means, and it is difficult to store and transport. If we could find a way to produce it more easily, then we would have access to a frighteningly large amount of energy. Just think — an object with the mass of a small asteroid, made of antimatter, would be enough to annihilate an entire planet like Earth!

For the purpose of spacecraft propulsion, antimatter could be used to produce energy by causing some antiatoms and a few atoms to interact. The energy produced would be enough to accelerate a spacecraft up to one-tenth the speed of light — potentially even up to one-third the speed of light, with sufficient repetition of the process.

## PLANETS

There are five types of planets represented in the game: rocky planets, super-Earths, oceanic planets, gas giants, and alien planets.

**Rocky Planets:** Also known as terrestrial planets, these are large planets able to dominate their orbit. They are spherical with complex surfaces and interiors with an active geological past or present (e.g., tectonic plates, volcanoes, oceans). In the solar system, the rocky planets are Mercury, Venus, Earth, and Mars.

If you would like to see the surface of a rocky planet more closely, just look up at the sky on a clear night: The Moon has all the features of a rocky planet, including high habitability potential. She's a satellite (yes, the use of "she" instead of "it" is lovingly intended) tied to Earth's orbit, but she's slowly moving away from Earth (at a rate of 3.8 centimeters per year) and her center of gravity will eventually emerge from Earth's orbit and she will become an independent planet orbiting around the sun!

Rocky planets are the ideal places for life. The levels of terraforming required varies, as there are many kinds of rocky planets. Around other stars there are some worlds so carbon-rich that they probably have a crust made of diamonds! There are still other planets on which it rains glass (imagine the parking fees!), and others where one side always faces its star.

For this reason, in the game, the matter and energy production of the different rocky planets varies as well. These planets all yield 2 when colonized and 0 when terraformed, because terraforming rocky planets, due to their predisposition toward life, requires only minor alterations.

**Super-Earths:** The term super-Earth refers to the mass of the planet, and not to other properties such as surface conditions or habitability. Super-Earths are like a cross between rocky planets and gas giants. There are no super-Earths in the solar system (as far as we know), as the largest rocky planet is the Earth and the next biggest planet, Uranus, is a gas giant with a mass about 14 times that of Earth.

These worlds could be habitable, but at present we do not know much about their composition. They are considerably more massive than Earth, with thicker atmospheres. Scientists have coined other terms, of less widespread use, to emphasize certain probable characteristics of some identified super-Earths: nano-gas for the most massive planets of this type, probably composed of large amounts of gas; and super-Venus or super-Pluto for planets with extremely high or low surface temperatures, like their counterparts in the solar system! Long story short — colonizing and terraforming a super-Earth would be difficult, but highly rewarding.

In the game, these planets yield 0 when colonized and 2 when terraformed. This is to represent that they are not habitable when you discover them, but become highly resourceful after the terraforming process.

**Oceanic Planets:** Oceanic planets are a type of super-Earth that may be covered entirely or almost entirely by water oceans. It's hard to tell if they are also habitable, since the water descending into the deep and causing enormous pressure could eventually create a great crust of ice as a backdrop. If there is no energy or continuous addition of material from volcanoes, these oceans may also be sterile and lifeless. Alas, it's something we have yet to discover.

In the game, these planets yield 1 when colonized and 1 when terraformed. It is always good to find an abundance of water as a resource, and the terraforming process, which may be as simple as the development of habitable islands, represents a major advance, nonetheless.

**Gas Giants:** Aptly named, gas giants are huge planets like Jupiter, and can even be up to 10 times larger than that. They're rich in helium and hydrogen, like stars in some aspects, but with huge storms and spectacular clouds! They are often surrounded by systems of smaller planetary bodies (e.g., the moons of Saturn).

There are also ice giants, like Uranus and Neptune, which are typically much colder. Unlike standard gas giants, these are richer in methane, ammonia, and certain other compounds. They are also smaller and less dominated by helium and hydrogen.

In the game, these planets yield 1 when colonized and 2 when terraformed. Even though true terraforming is not possible for planets of this type, they are still an immense source of material and energy. The implication is that their moons will be terraformed, but even this process requires a high level of terraforming technology.

**Alien Planets:** These planets already host non-sentient lifeforms like plants or animals. This makes terraforming particularly difficult, because the arrival of humans, laden as we are with our own bacteria, would probably lead to the extinction of all alien life. This type of advanced terraforming process would require a high understanding of antimatter and its technological application, because antimatter is a rich source of energy that would fuel the necessary machinery. The particle accelerators indispensable to producing this energy could also serve to create atoms and specific ions needed for environmental changes.

In the game, alien planets yield 2 when colonized and 2 when terraformed, because they are by far the rarest, most difficult, and most wonderful to discover. Terraforming an alien planet, while fraught with challenges, would allow humanity to live in an environment so conducive to life that life arose on its own, prior to human intervention.

There are other kinds of planet-like objects that are not represented in the game:

**Proto-planets** are small celestial bodies with a diameter ranging from 100 to 500 km. They have an internal stratification much like planets — with a core, mantle, and crust — but they don't have enough mass to be entirely spherical like real planets.

**Dwarf planets** are celestial bodies with a diameter ranging from 800 to 3,000 km. They are often found in areas rich with fragments like asteroids and comets. Unlike true planets, dwarf planets (like Pluto) are not large enough to completely dominate their orbit.

**Brown dwarfs** are large celestial bodies — larger than planets, but smaller than stars. In some respects, from the outside, they still resemble planets, but they are 10 to 30 times the mass of Jupiter, often with cores that look like those of stars. Brown dwarfs are also much hotter than gas giants.

## SPACE TRAVEL

One of the biggest problems with travel at very high speeds is the need to slow down as you approach the destination. All the energy used at the beginning to accelerate the spacecraft will be needed again to slow it down! And if you take advantage of the slingshot effect from celestial bodies encountered along the way in order to reach even higher speeds, you'll need that much more energy to slow down.

NASA's New Horizons probe, which reached Pluto in July 2015, flew by without stopping because it marched around Pluto at 15 km/s. To slow it down enough to orbit the dwarf planet, we would have needed to use a large rocket propulsion system like the one that brought the probe into orbit… burning at full throttle for two weeks!

Travel at very high speeds also creates some relativistic problems, making it extremely difficult to remain in radio contact with Earth. In addition, time would flow quite differently — a spacecraft traveling at speeds necessary for practical space travel would seem to be going into the future, compared to Earth time.

Fortunately, things like warp drives and wormholes do not need very high speeds. In both cases they bend spacetime, shortening the distance between two locations. Of course, for now these are only theoretical, but who knows what the future holds...

However, it is very likely that if space travel is ever going to be organized without the assistance of warp-drives and wormholes, the project would be generation spanning — in other words, missions would last centuries, and starships would be constructed to allow several successive generations to live on board while in transit.

## SAGITTARIUS A*

At the center of the Milky Way, there's an area known as Sagittarius A*, which is thought to be the location of a supermassive black hole. We don't know its composition with any certainty. What we do know is that it's located 26,000 light years from Earth.

Despite having a mass equivalent to four million times that of the sun, Sagittarius A* has a diameter of "only" 44 million km. If it were at the center of the solar system, it would reach only to the orbit of Mercury. Even the sun, when it dies, will be much bigger! (The "diameter" of the black hole is what we know as the event horizon — the point beyond which the required escape velocity is so great that even light cannot escape.)

Stars, nebulae, and asteroids periodically come close enough to be "eaten" by the black hole. When this happens, a very bright accretion disk forms around the black hole, where some particles are ejected from the top and bottom of the galaxy at enormous speeds.

## HUMANITY IN 3042

Humans are social. We dominate the planet because we always help each other. Many things we do require the continuous and coordinated effort of huge groups of people. Think about simple things like taking a coffee in the morning: We need thousands of people in order to have a functioning water purification system that runs water to each house, and we need thousands more people employed in the production, transportation, and sale of coffee. Then, in another part of the world, we need people mining iron for the very bones of our coffee machines, as well as for water pipes, vehicles, and drinking vessels.

That is just one little example to show how our complex society is fundamentally linked to collaboration and the economy behind this collaboration. The more complex things we attempt, the more collaboration we'll need. Future interstellar missions will surely be that way — it's impossible for a single civilization to attempt space travel without other civilizations being close on the evolutionary ladder.

Imagine attempting to sell digital marketing services to a Neanderthal. Before he would have any need of it, you'd first need to teach him many intermediate technologies. Thus it will always be beneficial for "A" to have partners like "B" and "C" not too far behind — when A does have some difficulty in technological progression, if B and C were far behind there would be no way they could help. This is why, throughout the history of humanity, there have always been efforts to create leagues, groups, unions, etc., designed to cooperate in order to achieve mutual goals.

## Publisher's Note:

*In the game, these inextricably linked civilizations are represented by the players, and the*  *mechanism exists precisely to emphasize this aspect of interconnection. In order for humanity to reach levels of technology such as this game imagines we might have by the year 3042, we will have to overcome the divisions that continue to hold us back — even though today, it may seem that we never will. But we hope heartily that someday we will find a way. For this reason, in the game there is no military aspect, nor do you encounter hostile lifeforms on alien planets. Kepler-3042 is intended as an ode to space exploration and scientific achievement. When you measure yourself against your adversaries, we invite you to think that your desire to write your name in the history books is legitimate, since it is this motivation that has always driven the advancement our culture, science, and technology. But keep in mind that each technology you discover, each planet you terraform and colonize, and every hidden corner of the galaxy you explore, will be a triumph for all humanity.*


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