

[Home](#) \* [Engines](#) \* **Ethereal**



Ethereal night sky <sup>[3]</sup>

### **Ethereal,**

an [UCI](#) compliant [open source chess engine](#) written by [Andrew Grant](#) in [C](#), licensed under the [GNU GPL](#) and first officially released in June 2016 <sup>[1]</sup>. Ethereal is greatly influenced from [Crafty](#), [Stockfish](#), [TSCP](#), [MadChess](#), and [Fruit](#) <sup>[2]</sup>.

## **Table of Contents**

[Features](#)

[Board Representation](#)

[Search](#)

[Evaluation](#)

[See also](#)

[Forum Posts](#)

[2016](#)

[2017](#)

[2018](#)

[External Links](#)

[Chess Engine](#)

[Misc](#)

[References](#)

[What links here?](#)

## Features

[\[4\]](#)

### Board Representation

- [Bitboards](#)
- [Fancy Magic Bitboards](#)
- [8x8 Board](#)

### Search

- [Lazy SMP](#) since 8.60 SMP [\[5\]](#)
- [Iterative Deepening](#)
- [Aspiration Windows](#)
- [PVS Alpha-Beta](#)
- [Transposition Table](#)
- [Selectivity](#)
  - [Check Extensions](#)
  - [Delta Pruning](#)
  - [Futility Pruning](#)
  - [Late Move Reductions](#)
  - [Null Move Pruning](#)
  - [Razoring](#)
  - [Reverse Futility Pruning](#) (Static Null Move Pruning)
- [Move Ordering](#)
  - [Internal Iterative Deepening](#)
  - [MVV/LVA](#)
  - [Killer Heuristic](#)
  - [History Heuristic](#)
  - [Piece-Square Tables](#)

### Evaluation

- [Tapered Eval](#)
- [Material](#)
- [Piece-Square Tables](#)
- [Mobility](#)
- [Outposts](#)
- [Rook on \(Half\) Open File](#)
- [Rook on 7th Rank](#)
- [Castling Ability](#)
- [Pawn Hash Table](#)

- [Pawn Structure](#)

## See also

- [Astronomy](#)

## Forum Posts

### 2016

- [Re: How to speed up my engine](#) by [Günther Simon](#), [CCC](#), May 03, 2016
- [Re: How to speed up my engine](#) by [Andrew Grant](#), [CCC](#), May 03, 2016
- [Ethereal Bitboard 6.26 Chess Engine...a star is born!](#) by AA Ross, [CCC](#), May 14, 2016
- [Ethereal - Official Release](#) by [Andrew Grant](#), [CCC](#), June 25, 2016
- [Ethereal - Official Release](#) by [Andrew Grant](#), [CCRL Discussion Board](#), June 25, 2016
- [Release of Ethereal7.78](#) by [Andrew Grant](#), [CCC](#), September 04, 2016

### 2017

- [Official release of Ethereal8.16](#) by [Andrew Grant](#), [CCC](#), June 03, 2017
- [Ethereal8.28 Release](#) by [Andrew Grant](#), [CCC](#), September 13, 2017
- [Ethereal8.37 Release](#) by [Andrew Grant](#), [CCC](#), November 10, 2017
- [Release of Ethereal 8.60 SMP](#) by [Andrew Grant](#), [CCC](#), December 10, 2017
- [Ethereal 8.61 -- Small bugfix to 8.60](#) by [Andrew Grant](#), [CCC](#), December 12, 2017
- [Time Managment translating to SMP](#) by [Andrew Grant](#), [CCC](#), December 23, 2017 » [Parallel Search](#), [Time Management](#)

### 2018

- [Official Release of Ethereal9.00](#) by [Andrew Grant](#), [CCC](#), February 15, 2018
- [Official Release of Ethereal9.30](#) by [Andrew Grant](#), [CCC](#), March 20, 2018

## External Links

### Chess Engine

- [GitHub - AndyGrant/Ethereal: Ethereal UCI Chess Engine](#)
- [Ethereal](#) in [CCRL 40/4](#)

### Misc

- [ethereal - Wiktionary](#)
- [Ethereal from Wikipedia](#)

- [Ether from Wikipedia](#)
- [Ethereal wave from Wikipedia](#)
- [Ethereal cardinal from Wikipedia](#)
- [The Ethereal](#) from [Truth is Beauty](#), July 07, 2015
- [Jean luc Ponty](#) - [Ethereal Mood](#) (1978), [YouTube](#) Video

## References

1. [^](#) [Ethereal - Official Release](#) by [Andrew Grant](#), [CCRL Discussion Board](#), June 25, 2016
2. [^](#) [Ethereal/README.md at master · AndyGrant/Ethereal · GitHub](#)
3. [^](#) A [total eclipse](#) of the [Moon](#) is an impressive spectacle. But it also provides another viewing opportunity: a dark, moonlight-free starry sky. At [Cerro Paranal](#) in the Chilean [Atacama Desert](#), one of the most remote places in the world, the distance from sources of light pollution makes the night sky all the more remarkable during a total [lunar eclipse](#). This [panoramic photo](#), taken by [ESO](#) Photo Ambassador [Yuri Beletsky](#), shows the view of the starry sky from the site of ESO's [Very Large Telescope](#) (VLT) at Cerro Paranal during the total lunar eclipse of December 21, 2010. The reddish disc of the Moon is seen on the right of the image, while the [Milky Way](#) arches across the heavens in all its beauty. Another faint glow of light is also visible, surrounding the brilliant planet [Venus](#) in the bottom left corner of the picture. This phenomenon, known as [zodiacal light](#), is produced by sunlight reflecting off dust in the plane of the planets. It is so faint that it's normally obscured by moonlight or light pollution. [Image](#) by ESO, Yuri Beletsky, [CC BY 4.0](#), [Wikimedia Commons](#), [Beauty from Wikipedia](#)
4. [^](#) Features based on [GitHub - AndyGrant/Ethereal: Ethereal UCI Chess Engine](#)
5. [^](#) Ethereal's 8.60 [Lazy SMP](#) inspired by [Demolito](#) by Lucas Braesch, see [Release of Ethereal 8.60 SMP](#) by [Andrew Grant](#), [CCC](#), December 10, 2017

## What links here?

Page	Date Edited
<a href="#">Andrew Grant</a>	Jan 13, 2018
<a href="#">Engine releases</a>	Apr 23, 2018
<a href="#">Engines</a>	Mar 10, 2018
<a href="#">Ethereal</a>	Mar 20, 2018
<a href="#">TCEC Season 11</a>	Apr 18, 2018

[Up one Level](#)