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## Lifes Ratchet How Molecular Machines

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#### Life's Ratchet: How Molecular Machines Extract Order from ...

Life's Ratchet: How Molecular Machines Extract Order From Chaos Hal Harris | Tue, 04/30/2013 - 21:09 Peter Hoffman is a physicist and materials scientist, and he brings those perspectives and sensibilities to the description of how life converts chemical energy into order and motion.

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Life's Ratchet: How Molecular Machines Extract Order from Chaos. The cells in our bodies consist of molecules, made up of the same carbon, oxygen, and hydrogen atoms found in air and rocks. But molecules, such as water and sugar, are not alive. So how do our cells--assemblies of otherwise "dead" molecules--come to life,...

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Our cells are filled with molecular machines, which, like tiny ratchets, transform random motion into ordered activity, and create the "purpose" that is the hallmark of life. Tiny electrical motors turn electrical voltage into motion, nanoscale factories custom-build other molecular machines, and mechanical machines twist, untwist, separate and package strands of DNA.

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Life's Ratchet: How Molecular Machines Extract Order from Chaos by Peter M Hoffmann, Life is an enduring mystery Yet, science tells us that living beings are merely sophisticated structures of lifeless molecules If this view is correct

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## Life's Ratchet: How Molecular Machines Extract Order from ...

Life's Ratchet: How Molecular Machines Extract Order from Chaos, Peter M. Hoffmann, Basic Books, 2012. \$27.99 (278 pp.). ISBN 978-0-465-02253-3 Buy at Amazon In the microscopic world, molecular machines carry out tasks, including transport, pumping, and assembly, that are associated with machines in the macroscopic world.

#### Life's Ratchet: How Molecular Machines Extract Order from ...

Get this from a library! Life's ratchet: how molecular machines extract order from chaos. [Peter M Hoffmann] -- "The cells in our bodies consist of molecules, made up of the same carbon, oxygen, and hydrogen atoms found in air and rocks. But molecules, such as water and sugar, are not alive. So how do our ...

#### Life's ratchet: how molecular machines extract order from ...

Below the calm, ordered exterior of a living organism lies microscopic chaos. Our cells are filled with molecular machines, which, like tiny ratchets, transform random motion into ordered activity, and create the "purpose" that is the hallmark of life. Tiny electrical motors turn electrical voltage into motion, nanoscale factories custom-build other molecular machines, and mechanical [...]

## Life's Ratchet: How Molecular Machines Extract Order from ...

Beneath the calm, ordered exterior of a living organism lies microscopic chaos, or what Hoffmann calls the molecular storm—molecules in liquid continuously crash into each other as part of their thermal motion. Yet powered by energy, microscopic molecular machines—the ratchets of the

title—work autonomously to create order out of the chaos.

## Life's Ratchet by Peter Hoffmann

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TY - JOUR. T1 - Review - Life's Ratchet: How Molecular Machines Extract Order from Chaos. AU - Haw, Mark. PY - 2012/11/8. Y1 - 2012/11/8. N2 - This is a review of 'Life's Ratchet: How Molecular Machines Extract Order from Chaos' by Peter M. Hoffmann Basic Books: 2012. 288 pp. ISBN: 9780465022533.

## Review - Life's Ratchet: How Molecular Machines Extract ...

Life's Ratchet: How Molecular Machines Extract Order from Chaos shows how the noisy atomic cloud gives rise to the orderly world of the molecular machine – and to life itself. The cells in our bodies consist of molecules, made up of the same carbon, oxygen, and hydrogen atoms found in air and rocks.

#### Life's Ratchet: How Molecular Machines Extract Order from ...

"Life s Ratchet" does an excellent job of conveying the tension between mechanical descriptions of molecular machines...and the chemical perspective.... I highly recommend this book to scientists in the fields of biophysics and nanoscience as a readable introduction to a broad variety of topics in those areas.

## Life's Ratchet: How Molecular Machines Extract Order from ...

Get this from a library! Life's ratchet: how molecular machines extract order from chaos. [Peter M Hoffmann] -- Below the calm, ordered exterior of a living organism lies microscopic chaos, or what the author calls the molecular storm--specialized molecules immersed in a whirlwind of colliding water molecules. ...

## Life's ratchet: how molecular machines extract order from ...

Energy can be used to destroy information, to forget and reset molecular state. In cells, this energy is provided by ATP losing a phosphorous atom and converting to ADP. It seems insignificant, but at the nanoscale this minuscule jump burns at 7000 degrees. It is these fiery sparks of forgetfulness that drive life's ratchet and make life possible.

#### Life's Ratchet: How Molecular Machines Extract Order from ...

This week I finished reading Life's Ratchet: How Molecular Machines Extract Order from Chaos, by Peter Hoffmann. This book is mostly about molecular biophysics, which Russ Hobbie and I purposely avoid in the 4th edition of Intermediate Physics for Medicine and Biology. But the workings of tiny molecular motors is closely related to thermal motion (Hoffmann calls it the "molecular storm ...

#### Intermediate Physics for Medicine and Biology: Life's Ratchet

In Life's Ratchet, physicist Peter M. Hoffmann locates the answer to this age-old question at the nanoscale. The complex molecules of our cells can rightfully be called "molecular machines", or "nanobots"; these machines, unlike any other, work autonomously to create order out of chaos.

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