

Some topics on gender issues related to Nuclear Astrophysics Calendar

based on a *Keynote Talk at the IAU symposium on Equality, Equity, and Inclusion in Astronomy, celebrating the 100-year of IAU (Nov. 2019, Tokyo)*

**Yuko MOTIZUKI
(RIKEN)**

- 1) Hungarian edition of Nucleosynthesis Video
- 2) Improvement in Toshiko Yuasa's profile
- 3) Key points in gender issues

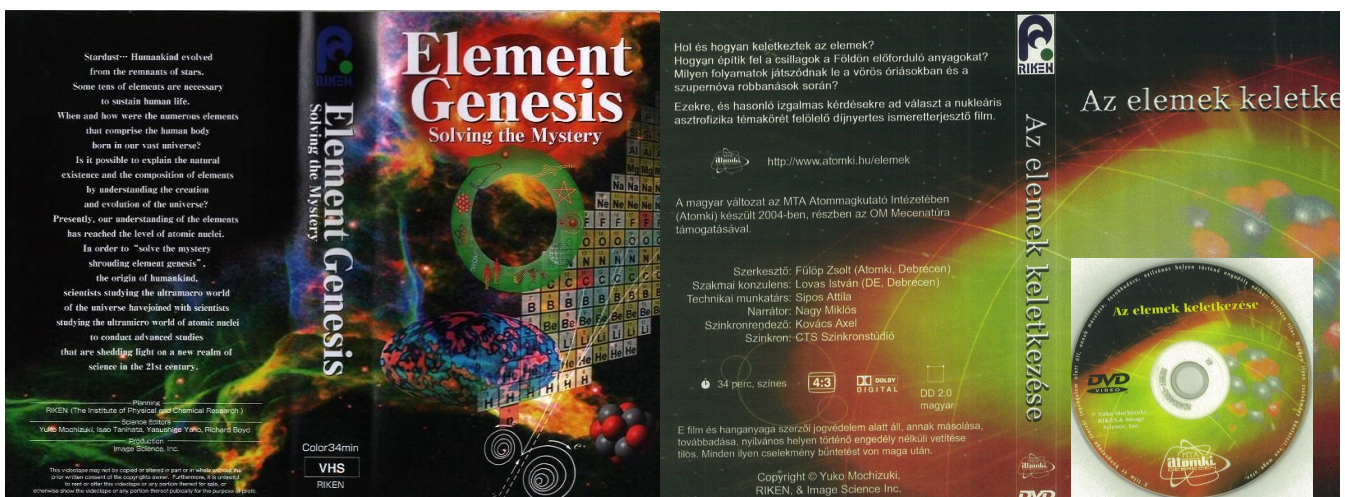
UKAKUREN seminar, March 7, 2022



“Element Genesis – Solving the Mystery” (34 min.)



©Yuko MOTIZUKI, RIKEN, 2001, 2002, 2006



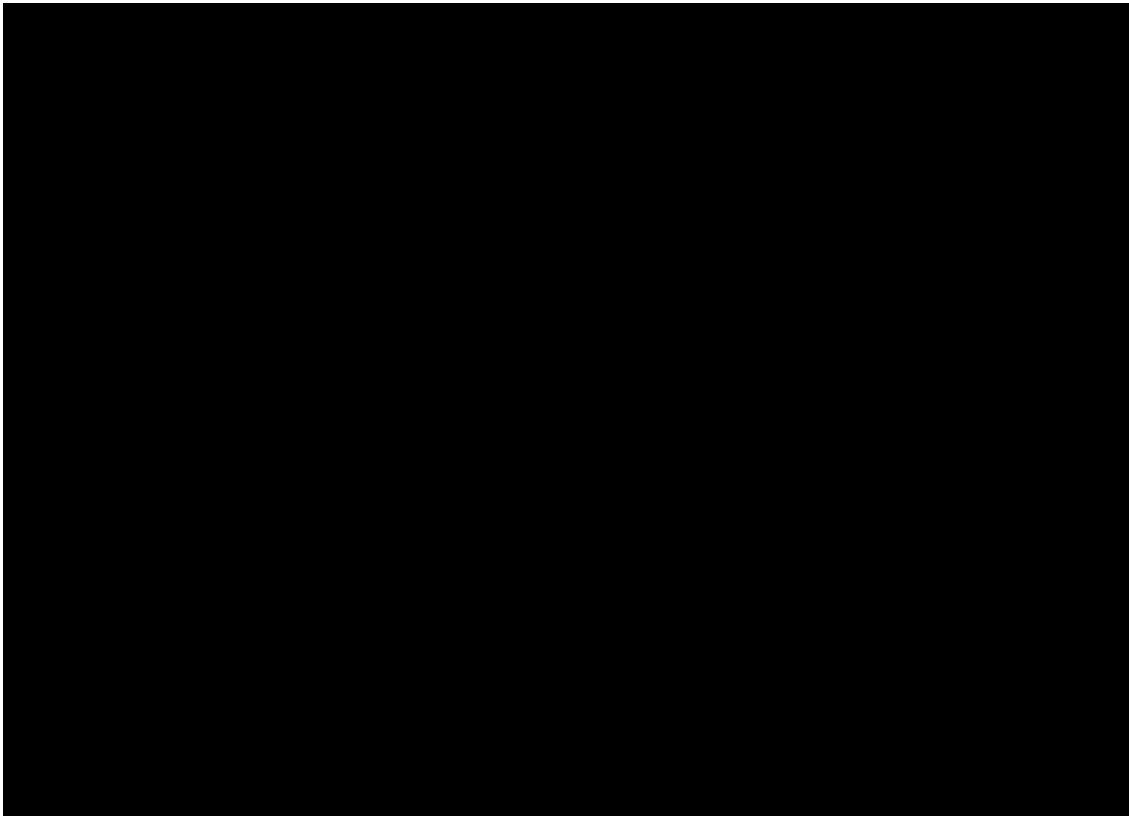
Japanese & English Editions

Hungarian Edition:
translated by Fulop Zsolt (ATOMKI)

received:

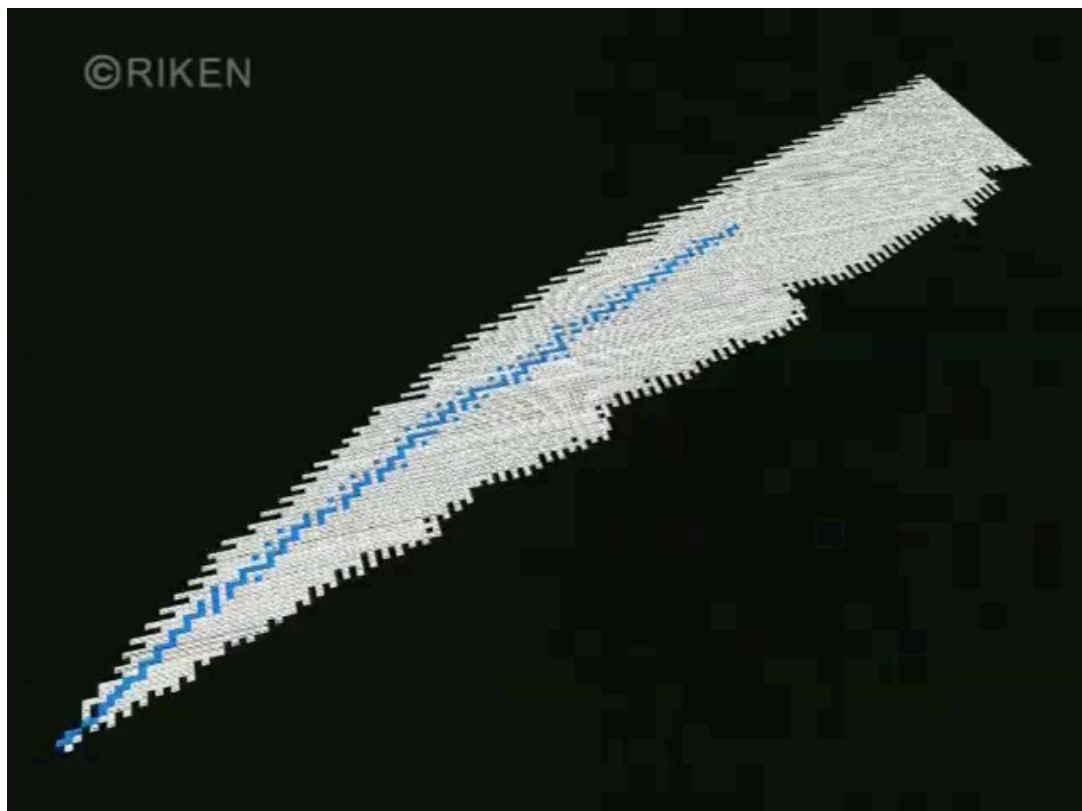
- **Creative Excellence Award** at the 35th (2002) U.S. Int. Film and Video Festival
- **MEXT Minister's Prize** at the 42th (2001) Japan Sci. Tech. Film and Video Festival
- **First Prize** at the 39th (2001) Japan Industrial Film and Video Competition

**“Element Genesis” Hungary Edition (34min)
supervised by Dr. Fulop Zsolt**



The 3D Valley of Beta Stability

extracted from **“Element Genesis” English Edition**



Toshiko Yuasa

湯浅 年子

「科学の根本精神は、広い豊かな愛である。」 - 湯浅年子

湯浅年子は、日本初の女性の原子核物理学者として知られています。年子は、東京文理科大学で原子分光學を学び、1934年に卒業しました。1939年にフランス政府の奨学金を得て、パリへ渡航、フレデリック・ジュリオ=キュリー教授のもとで人工放射能の研究を始めます。1943年、年子は「人工放射性核から放出されたβ線連続スペクトルの研究」により、フランス国家理学博士号を授与されました。しかし、すでに第二次世界大戦が勃発しており、日本人の年子は、翌1944年には戦時のパリからの退避を余儀なくされました。退避先のベルリンでは、世界初の二重点型β線分光器を開発し、終戦直前に日本へ帰国しました。そして、のちのお茶の水女子大学の教授として教育に尽力するとともに、理化学研究所仁科研究室で研究を再開しましたが、敗戦後の日本では、原子核物理の実験は禁止されてしまいました。年子は、フランス国立科学研究センター (CNRS) で研究を続けるため、1949年、再び渡仏します。その後は、研究の幅をβ崩壊から核反応へと広げ、重要な論文を次々と発表しました。また、1956年には、ビキニ環礁での水爆実験と第五福竜丸被爆についての日本の資料を仏訳して雑誌に寄稿するなど、水爆実験の危険性を広く訴えました。お茶の水女子大学では、日仏共同事業「湯浅年子ラボラトリー*(TYL)」の協力を得て、2013年に「湯浅年子賞」を設立し、日本の女性研究者が国内外で活躍することを支援しています。

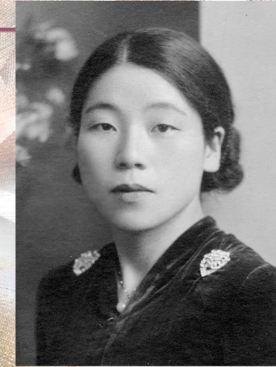
*日本の高エネルギー加速器研究機構 (KEK)、フランス原子核素粒子研究所 (CNRS/IN2P3)、フランス宇宙基礎科学研究所 (CEA/Irfu) が共同で運営している仮想研究所

トリビア

- ✓ 年子は再渡仏後、「放射能計測における計算則」と「ステレオカメラ」についての2つの特許を取得しました。
- ✓ 年子は、フランスで博士号を授与されてから19年後、京都大学からもβ崩壊に関する二つ目の博士号を授与されました。

背景画：「時空の織物 - 超新星II」

1909-1980



“Toshiko Yuasa” back-translation draft into English (All)

Toshiko Yuasa is the first female Japanese nuclear physicist. Yuasa studied atomic spectroscopy at Tokyo Bunrika University and graduated in 1934. In 1939, she obtained a scholarship from the French government and went to Paris, where she began to research artificial radioactivity under Frédéric Joliot-Curie. In 1943, she was awarded a Ph.D. in science from France with her thesis on the continuous beta-ray spectrum emitted by artificial radioactive material. However, with World War II being fought and Yuasa being Japanese, she was forced to leave Paris the following year. She went to Berlin, where she developed the world's first double-focusing beta-ray spectrometer. Just before the end of the war, she returned home to Japan. While devoting herself to education as a professor at what is now Ochanomizu University, she resumed her research at the Nishina Laboratory, RIKEN. However, following Japan's defeat in World War II, experiments in nuclear research were banned in the country. To continue her research at the French National Centre for Scientific Research (CNRS), Yuasa returned to France in 1949. She then expanded the scope of her research from beta decay to nuclear reactions and published a series of important papers. In 1956, Toshiko published a French translation of Japanese medical reports on hydrogen bomb testing at Bikini Atoll and the crew of the *Daigo Fukuryu Maru* affected by the nuclear fallout as an article in a medical magazine, with the goal of alerting the French public of the dangers of nuclear bomb testing. She later became the namesake of the Toshiko Yuasa Laboratory*(TYL), a joint Japanese-French research body. With the cooperation of the TYL, Ochanomizu University established the Toshiko Yuasa Prize in 2013 to support the domestic and international activities of Japan-based female scientists.

*A virtual laboratory run jointly by the High Energy Accelerator Research Organization (KEK) in Japan and the French-based National Institute of nuclear and Particle Physics (CNRS/IN2P3) and Institute of research into the fundamental laws of the Universe (CEA/Irfu).

Trivia

- ✓ After returning to France, Yuasa received two patents: one for “Calculation rule radioactivity measurements” and one for a “stereo-camera.”
- ✓ Nineteen years after earning a Ph.D. in France, Yuasa was awarded a second doctorate by Kyoto University related to her work on beta decay.

Notes on Improvements in Toshiko Yuasa's profile in Japanese Calendar*

- The most important improvement is in physics: a comment on her nuclear reaction studies added
- 2nd in her side work: her caution on the nuclear bomb testing to the society in the original text was complemented
- All improvements based on the facts: learned from more than 10 articles and papers in English, Japanese, and in French (+ a book of Toshiko's diary, related websites, Yuasa Prize rule of O. Univ.)

About the back-translation draft into English:

- The revision in Toshiko's profile in Japanese Calendar will be reflected to the original text when the grids for the 2023 Calendar is ready (*see Maria's final slide in this seminar*)
- Note: An English text always becomes longer than a Japanese text when we try to express the same content because Japanese and English languages are totally different (i.e., Chinese characters, 漢字)
 - It's easier to shorten the text than to lengthen it!

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Some topics on gender issues related to Nuclear Astrophysics Calendar

based on **Keynote Talk** at the IAU symposium on *Equality, Equity, and Inclusion in Astronomy, celebrating the 100-year of IAU* (Nov. 2019, Tokyo)

- 1) **A summary of basic knowledge**
- 2) **Affirmative action in Japan**
- 3) **What WE need**

Yuko MOTIZUKI

former Vice-President, ASJ, 2017-2015

- Executive Committee Member, Women in Astronomy, IAU, 2012-2009, and
 - Working Group Member, Women in Astronomy, IAU, 2018–present
 - Member, Gender Equality Committee, ASJ, 2017-2006, and
 - Observer(Advisor), GEC, ASJ, 2018–present
- She introduced child-care for JPS annual meetings based on that of ASJ (2010–) and had contributed to the child-care service at JPS for more than 10 years
- She introduced networking for women researchers at ASJ annual meetings, including men (2010–present)

Minority and Majority

Most up-to-date definition worldwide:

- Majority: People who were advantaged
「マジョリティ」は「有利であった人たち」
 - Minority: People who were disadvantaged
「マイノリティ」は「不利であらざるを得なかった人たち」
 - Male scientists are also a minority in society
- ✓ Ichiro's comment "I recognized for the first time when I went to the US what a minority is. And I'm in a minority."
「アメリカに行って初めて自分が(外国人という)マイノリティであることを知った。経験するまで日本ではわからなかった」

Why Diversity is Important

- "Diversity in scientific research is imperative because it leads to more innovative and creative ideas (refs.1-5)"
SCIENCE, Nov. 25, 2021, 374, 1063.
- Diversity is key to being more productive
- Recognition of diversity makes society stronger
- More diversity makes life easier for people of every gender
- **"Our sense of diversity develops with experience of interactions with many different people"**
– Prof. Sadako OGATA 緒方貞子(1927–2019), R.I.P., first woman and first Japanese and first academic Head of UNHCR (1990-2000)

An Important Concept [1]



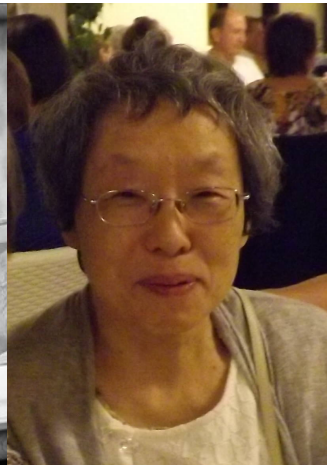
Prof. Jocelyn Bell Burnell,
UK

©The Guardian



Prof. Margaret Burbidge,
USA

Annie Gracy/Wikipedia, CC BY-SA



Prof. Mariko Kato,
Japan

©M. Kato

- Today's better environment for women has **NOT** been given freely, but achieved thanks to the efforts of a number of now **senior women and men**

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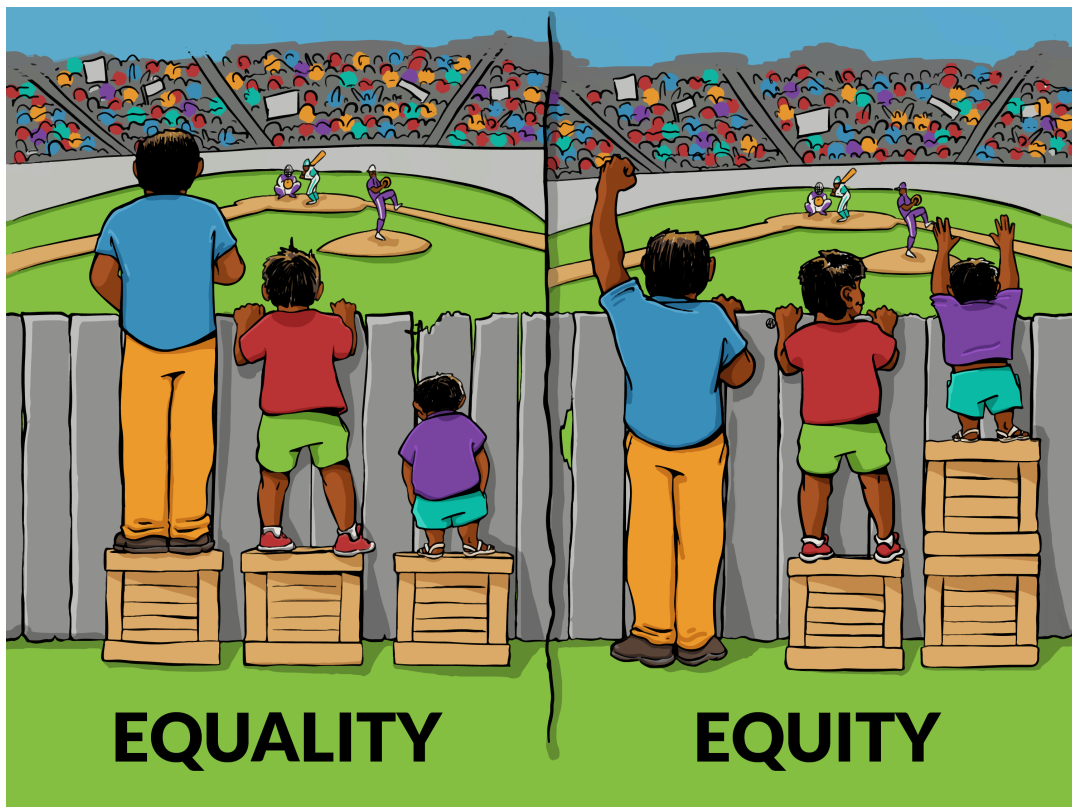
An Important Concept [2]

- Gender issue is not a problem only for women but for all of us, including every gender
- We need solidarity(連帯), women and men together
 - ✓ “HeforShe” Initiative: A solidarity campaign for the advancement of gender equality, initiated by UN
 - ✓ Process of the Calendar translation project
- Be inclusive! (「包摂的」であれ!) *Not exclusive 「排除」X*
 - ✓ “empathy” (共感) sympathy (同情)

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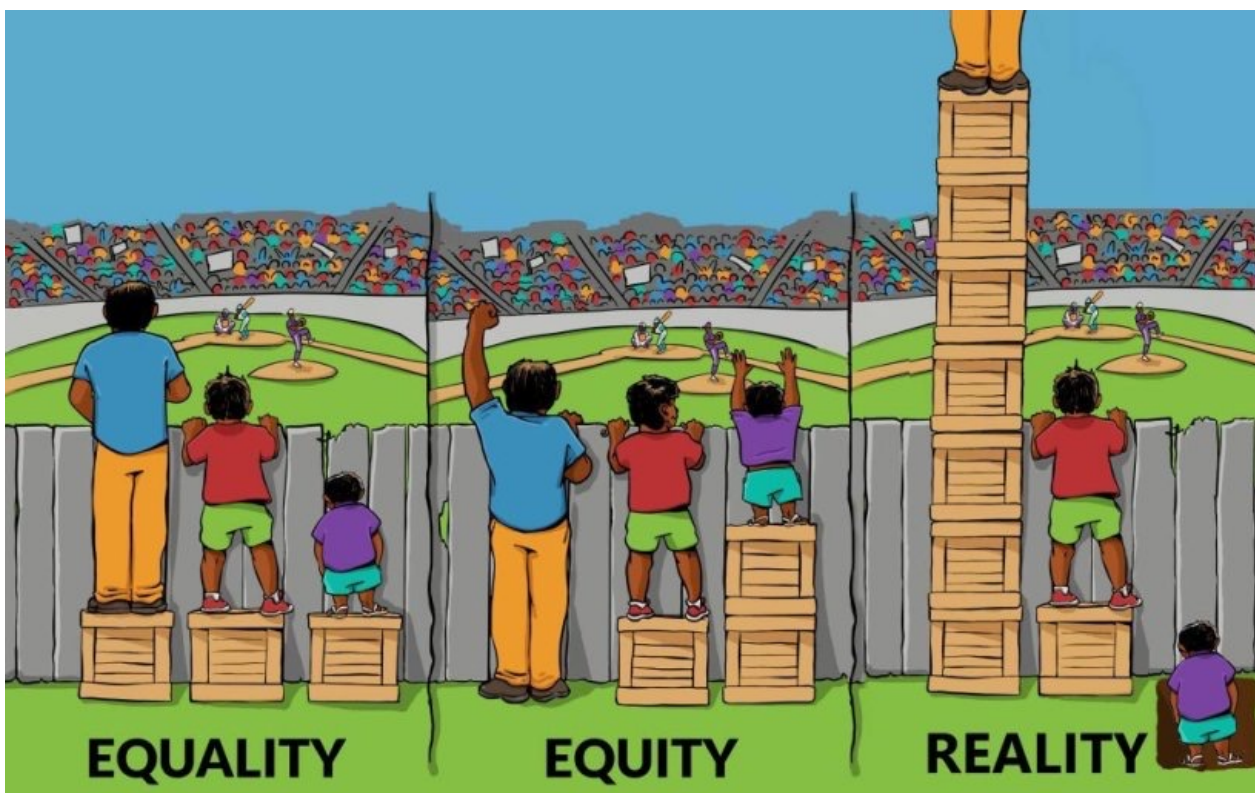
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Difference between Equality – Equity



Interaction Institute for Social Change | Artist: Angus Maguire 13

Difference between Equality – Equity (2)



Interaction Institute for Social Change | Artist: Angus Maguire 14

Evidence and Ability of Women – Affirmative Action in Japan –

- Many studies have found that unconscious gender bias creates unfairness in the evaluation of women and men researchers e.g., Dutt *et al.*, Nature Geoscience 9, 805, 2016
 - Affirmative action statistics of academic positions reserved for women, collected over ten years at Kyushu University, proved that:
 - Women selected for positions reserved for women were 1.3 times more productive than male colleagues in the same field and twice as productive as women recruited in the traditional way(!)
 - In a 2-step selection process, the second selection step included affirmation of commitment by the department heads to support women who passed the 1st step.
 - The affirmation of commitment enabled the women selected to feel secure and concentrate on their research
- Fair evaluation gives better results, not only for women but for people of every gender. One step towards equity!**

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Women in Decision-Making in the Astronomical Community

Indicator: **% Female** and **% Male** Full and Associate professors

USA: **< 25 %** (tentative value in 2019 for faculty members in astronomy departments as reported by AIP)

Selected statistics for East Asia:

Japan: **1.5-2.0%** **>15%**

Korea: **2.0%** **14%**

Taiwan: **3.7%** **19%**

- In the above areas women in decision-making in astronomical societies are **7 – 5 times less effective** than men
- The **critical mass** for a minority to influence the majority is known in social science to be **30–15%** of the population

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How *Minority Scientists* Can Be Empowered

We need:

- Increased %age of women leaders and their participation in decision making
- Fairer evaluation of all researchers and evaluators (at least in Japan) – unconscious bias and practice
- To recognize that *all physicists* are in a minority in society
- To develop diversity – key to being more productive
- To learn best practice from women and men in different fields
- Networking with like-minded researchers in our fields and other research fields
- To develop our professional and personal integrity together – all of us of every gender!

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- * Note added later: The revision of the Toshiko Yuasa profile in the Japanese version has been made with getting prior consent from Dr. Maria Lugaro, the Copyright holder of this Calendar, as a matter of course.



Thank you for your attention!