수학자로서의 삶

양 재 현 (梁在賢)
Jae-Hyun Yang

2013년 11월 15일 (금) 16:30 ~ 17:00

인하대학교 정석학술정보관 국제회의장

지난 34년간의 나의 학문의 여정을 간략하게 정리하였음

[1] 1979~1981년

(1-A) 1979년 7월에 유학 (UCB)

Jean-Pierre Serre

(1926- : Fields상+Wolf상+Abel상)

A Course in Arithmetic

학기가 시작하기 전에 읽음 (8월에)

Jean-Pierre Serre

(1-B) 1979년 가을학기 (9월-12월)

Ichiro Satake (佐武一郎, 1927-) 교수의 과목

[Several Complex Variables] 수강함

이 강의를 통해

Siegel domains of the first kind,

second kind and third kind

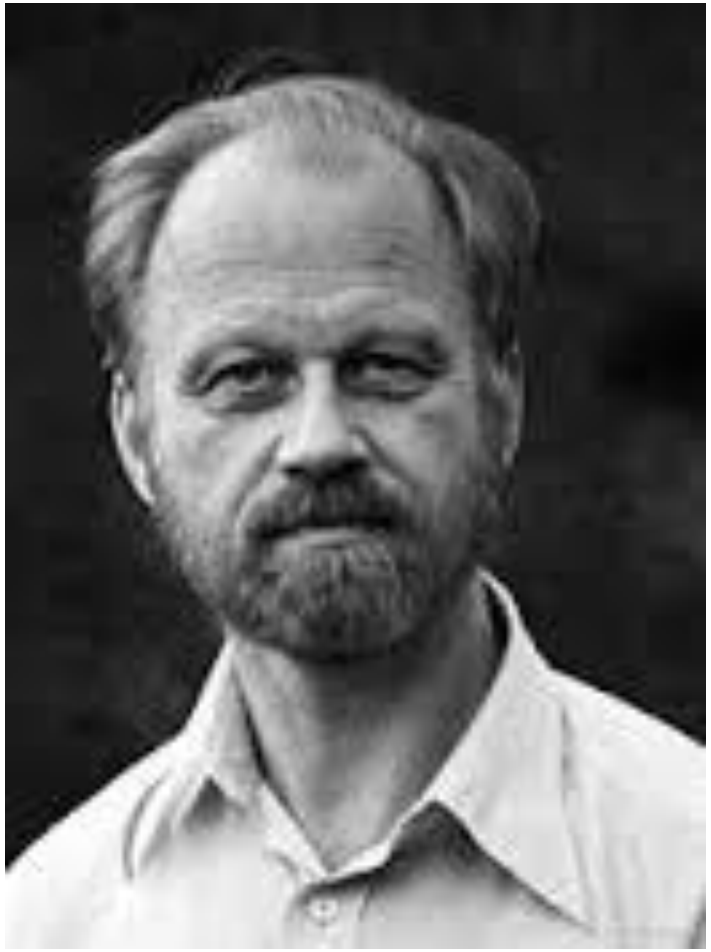
을 배우게 되어 독일의 위대한 수학자

Carl Ludwig Siegel

(1896-1981; 첫 번째 Wolf상 수상자)

을 알게 됨


Carl L. Siegel

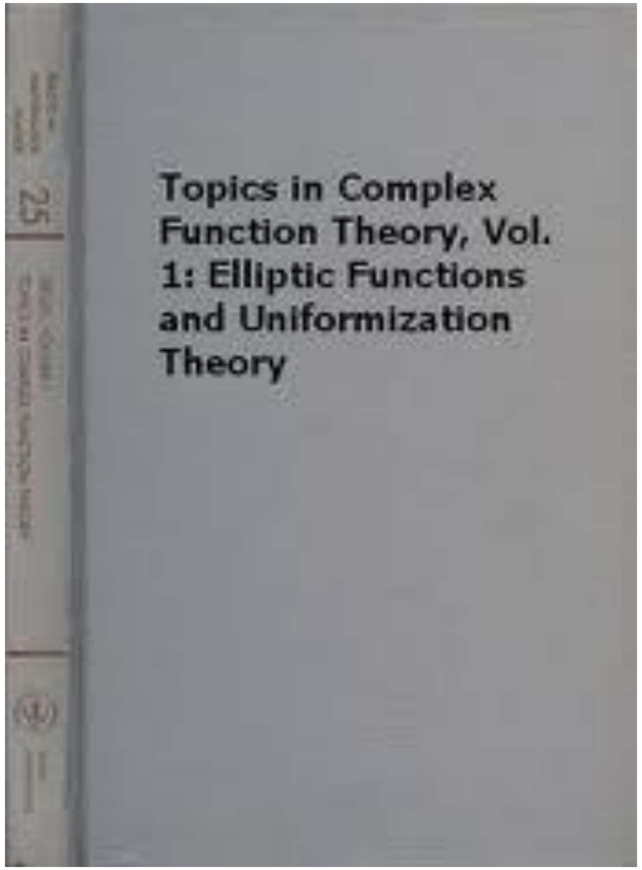


Jürgen Moser


Carl Ludwig
Siegel


Carl Ludwig
Siegel


CARL LUDWIG SIEGEL
MATHEMATIKER
1951 – 1981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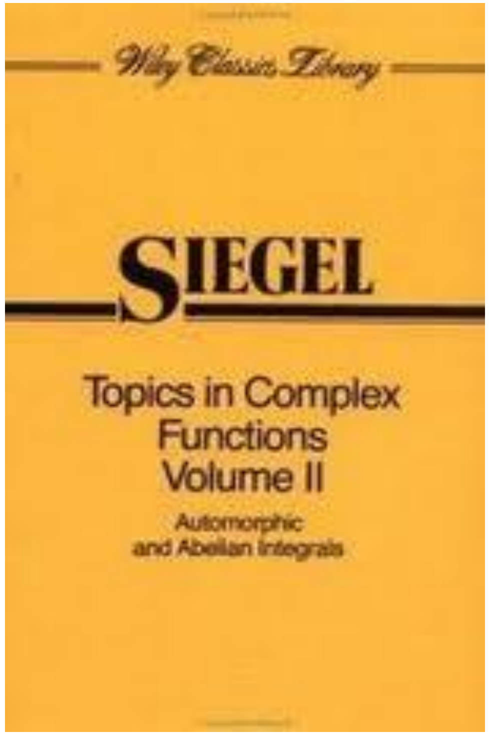
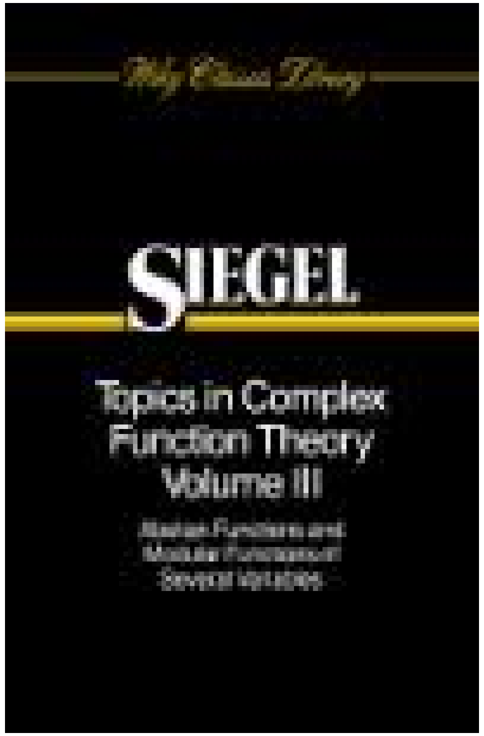
Topics in Complex Function Theory, Vol. 1: Elliptic Functions and Uniformization Theory


Wiley Classics Library
SIEGEL
Topics in Complex Functions Volume II
Automorphic and Abelian Integrals


SIEGEL
Topics in Complex Function Theory Volume III

(1-C) 1980년 겨울학기 (1월–3월)

Satake 교수의 과목을 수강함. 이 강의를 통해

Siegel Modular Forms에 관한 이론을 배우게 됨.

Siegel 과 Hans Maass (1911-1992) 의 연구업적을 배움 이 강의를 통해

André Weil (1906-1998: Wolf상+교토상)

Atle Selberg (1917-2007: Fields상+Wolf상)

Harish-Chandra (1923-1983)

의 이름을 알게 됨

(A) Weil 의 답변

As was custom, Weil often attended tea at [Princeton] University . Graduate student Steven Weintrab one day went about the room asking various famous mathematicians who was the greatest mathematician of the twentieth century. When he asked Weil, the answer (without hesitation) was

"Carl Ludwig Siegel (1896-1981).“

(B) In an published interview (pg. 30)

Selberg said

[Siegel] was in some ways, perhaps, the most impressive mathematician I have met. I would say, in a way, devastatingly so. The things that Siegel tended to do were usually things that seemed impossible. Also after they were done, they seemed still almost impossible.

André Weil

Atle Selberg

(1-D) 1980년 봄 학기 (3월-6월)

Satake 교수의 Seminar 과목을 수강함.

여기서 David Mumford (1937- : Fields상+Wolf상)의 유명한 논문

Hirzebruch's Proportionality Theorem in the Non-Compact Case

[Invent Math. 1977]

의 내용을 발표함. 이 논문을 통해

Theory of the Siegel Modular Variety에 관심을 가지기 시작함.

이 당시에 Shing-Tung Yau (丘成桐, 1949- : Fields상+Wolf상) 만남

(1-E) 1980년 6월 – 1981년 4월

박사자격시험(oral exam) 준비

- Modular Forms
- Differential Geometry
- Lie Groups and Lie Algebras

주제로 시험을 치러 1981년 4월에 합격함

★ 심사위원 5명:

- Gerhard Hochschild (1915-2010; Steele상 거절)
- Ichiro Satake (佐武一郎, 1927-)
- Shoshichi Kobayashi (小林昭七, 1932-2012)
- 컴퓨터 학과의 학과장
- 전자공학과 교수

Hochshild 와 Kobayashi 의 강의를 수강함

- Lie Groups and Lie Algebras
- Complex Surfaces + Vector Bundles

[2] 1981년 6월 – 1984년 5월

(2-A) 1981년 6월 – 1982년 8월

1981년 9월에 지도교수

Shoshichi Kobayashi (小林昭七, 1932-2012)를 만나 논문 주제에 대해 의견을 나눔.

★ Geometry of Automorphic Forms (e.g., Siegel Modular Forms)

★ Trace Formula

10월부터 Selberg's Trace Formula 에 관해

Kobayashi 교수의 연구실에서 매주 한 번 세미나 하기 시작함.

Tsuneo Tamagawa (玉河恒夫; 1925-)의

On Selberg's trace formula,

[J. Fac. Sci., Univ. Tokyo, vol. 8, 363-386 (1960)]

을 내가 지도교수 앞에서 무난하게 설명함.

다음은 유명한 Selberg 의 논문

Harmonic analysis and discontinuous groups in weakly symmetric Riemannian spaces with applications to Dirichlet series

[J. Indian Math. Soc. B., vol. 20 (1956), 47-87] 으로 지도교수의 연구실에서 매주 한 번 세미나 했지만 5번 정도하다가 논문을 이해하지 못해 중단함. 큰 이유 중의 하나가 수론에 관한 지식의 부족임.

이때부터 스트레스 받기 시작함. 연구에 진전이 없었고 무엇을 해야 할지 고민하기 시작함.

이 당시에 Friedrich Hirzebruch (1927-2012; Wolf상 + MPI 소장)의 저서

Topological Methods in Algebraic Geometry [Springer, 1956]와

David Mumford 의 저서 Abelian Varieties [TIFR]

를 중국 유학생과 세미나를 하며 읽음

(2-A) 1982년 9월 – 1984년 5월

1982년 9월에 논문 주제를 지도교수와 의논하여 바꾸기로 함

[Vector Bundles over complex tori]

Ph.D. Thesis (1984년 5월) :

[Einstein-Hermitian Vector Bundles]

小林昭七

Gerhard Hochschild

UCB에서 저명한 수학자들의 강의를 청강했다.

- Shiing-Shen Chern (陳省身; 1911-2004, NMS + Wolf상 + Shaw상)
- Stephen Smale (1930- ; Fields상 + Wolf상 + NMS)
- Isadore Singer (1924- ; NMS + Abel상)

그리고 저명한 수학자의 강연을 들을 기회가 있었음.

예를 들면, A. Weil,

Michael Atiyah (1929- ; Fields상 + Abel상)

Simon Donaldson (1957- ; Fields상 + Shaw상)

1983년에 Gerd Faltings (1954- : Fields상)가 Mordell Conjecture 해결함.

Kenneth Ribet (1948-)이 업적에 관해 강연함

[3] 1984~1988년

인하대학교 부임 (1984년 9월)

강의부담 (매주 6과목 18시간: 출강)

Riemann Schottky Problem 에 관심을 가짐

거의 연구하지 않음. 술 마시며 유흥에 빠짐

[4] 1988년 7월 ~ 1989년 8월

(4-A) Heidelberg 대학 (1988. 7–8)

Eberhard Freitag (1942-) 교수의 초청으로 방문

Singular modular forms on a tube domain 에 관해 공동연구하기로 함.

이 때 Jordan Algebra 에 관해 공부함.

Freitag 교수의 제자 Claus Ziegler 를 만남.

석사 학위(diploma) 논문 주제인 Jacobi Form 에 관한 4편의 preprint를 받음.

이 때 이 새로운 이론에 관해 관심을 가짐.

(4-B) Harvard 대학 (1988. 9 – 1989. 8)

Wilfried Schmid (1943-)

Yum-Tong Siu (1943-)

Barry Mazur (1937-)

Raoul Bott (1923-2005; Wolf상)

David Mumford (1937- ; Fields+Wolf+Shaw상)

Jean-Pierre Serre (1926-)

John Tate (1925- ; Wolf + Abel상)

Heisuke Hironaka (廣中平祐, 1931- ; Fields상)

Mixed Hodge Theory

Cohomology of the Siegel Modular Variety

Unitary Representations of a Lie Group

Langlands Program

[5] 1989 ~ 2001년

[A] 1992년 2월 11~13일 (인하대학교)

[International Symposium on Algebraic Geometry and Related Topics]

Shing-Tung Yau (丘成桐, 1949- ; Fields+Wolf상)

Shigefumi Mori (森重文, 1951- ; Fields상)

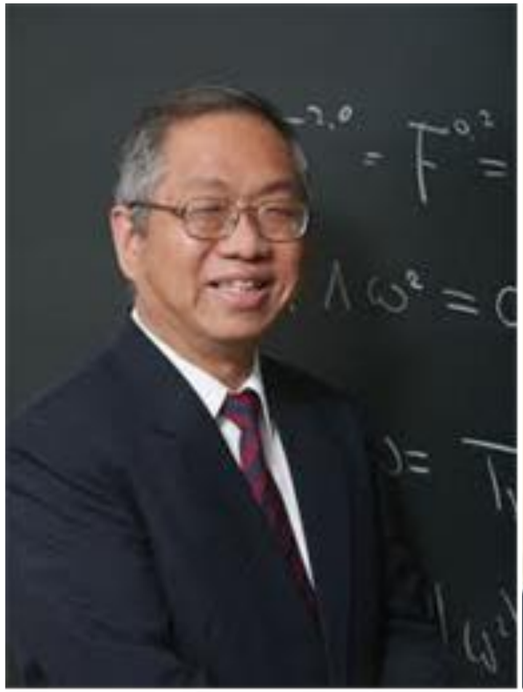
Wilfried Schmid (1943-)

Yum-Tong Siu (萧蔭堂; 1943-)

Eberhard Freitag (1942-)

Shigeru Mukai (向井茂, 1953-)

Kyoji Saito (齊藤恭司, 1944-)



Shing-Tung Yau

Shigefumi Mori

Proceedings을 International Press에서 출판

[B] 평산 수학연구소 (PIMS) 운영

(가) Max-Planck Institut, Bonn(1994. 1-2 and 1997. 1–4)

Friedrich Hirzebruch (1927-2012; Wolf상)

Don Zagier (1951-)

Gerd Faltings (1954- ; Fields상)

Maxim Kontsevich (1964- ; Fields + Shaw상)

(나) 1998년 10월 20-22일 (연세대학)

International Symposium on Number Theory and Related Topics

Y. Ihara, S. Mochizuki, S. Kudla, D. Prasad

Proceedings (고형준) : 연세대학 수리연구소

(다) 1999년 7월 20~22일 (연세대학)

Summer School on Representation Theory of Lie Groups

Wilfried Schmid, Toshiyuki Kobayashi, Wolfgang Soergel

[6] 2001 ~ 2004년

(가) 2002년 7월 9~11일 (전북대학)

International Conference on Subjects Relating to Clay Problems

S. M. Gonek, Cem Y. Yildirim, D. Prasad,

Kari Vilonen, Jae-Hyun Yang

(나) Harmonic Analysis on Minkowski-Euclid space

(다) 모친의 별세로 슬럼프에 빠짐 (자책감) (2~3년)

[7] 2005년 ~ 현 재

(가) 2005년 2월 14~17일 (서울대학교)

International Symposium on Representation Theory and Automorphic Forms

W. Schmid, Toshiyuki Kobayashi, Stephen Miller,

Freydoon Shahidi, Dinakar Ramakrishnan

Proceedings [Birkhäuser, 2008]

(나) 2008년 11월 25~27일 (인하대학교)

International Symposium on Automorphic Forms, L-Functions and Shimura Varieties

Haruzo Hida, V. Kumar Murty, Jan H. Bruinier, Hiroyuki Yoshida, Massaki Furusawa

(다) 2005년부터 본격적으로 다음의 토픽으로 연구하고 있음

Harmonic Analysis on Siegel-Jacobi Space

Natural

Deep

Simple

Beautiful

Meaningful

[수학자의 심리 세계]

아스페르거 증세(Asperger Syndrome)

자폐증(autism)

John Nash (1928- ; Nobel 경제학상[1994])

Andrew Wiles, Shigefumi Mori,

Richards Borcherds (1959- ; Fields상)

Grigory Perelman (1966- ; Fields상)

[대한민국의 수학]

- 2014년 8월 13~21일 서울 COEX 에서 ICM (세계수학자대회) 개최
- 지난 30년 사이에 수학 분야에 큰 발전이 있었음

  이젠 ICM 초청연사가 10명을 넘었음 (2006년 ICM부터)
- 자기 자신의 수학을 창조
- 새로운 수학분야를 개척

  과감한 도전정신, 열정, 인내심,

  실패를 두려워하지 않음
- 발견(discovery), 창조(creation), originality, 신의 계시

학문적으로 영향을 준 수학자 (롤 모델)는

Carl Ludwig Siegel

(1896-1981)

André Weil

(1906-1998)

Atle Selberg

(1917-2007)

Robert Langlands

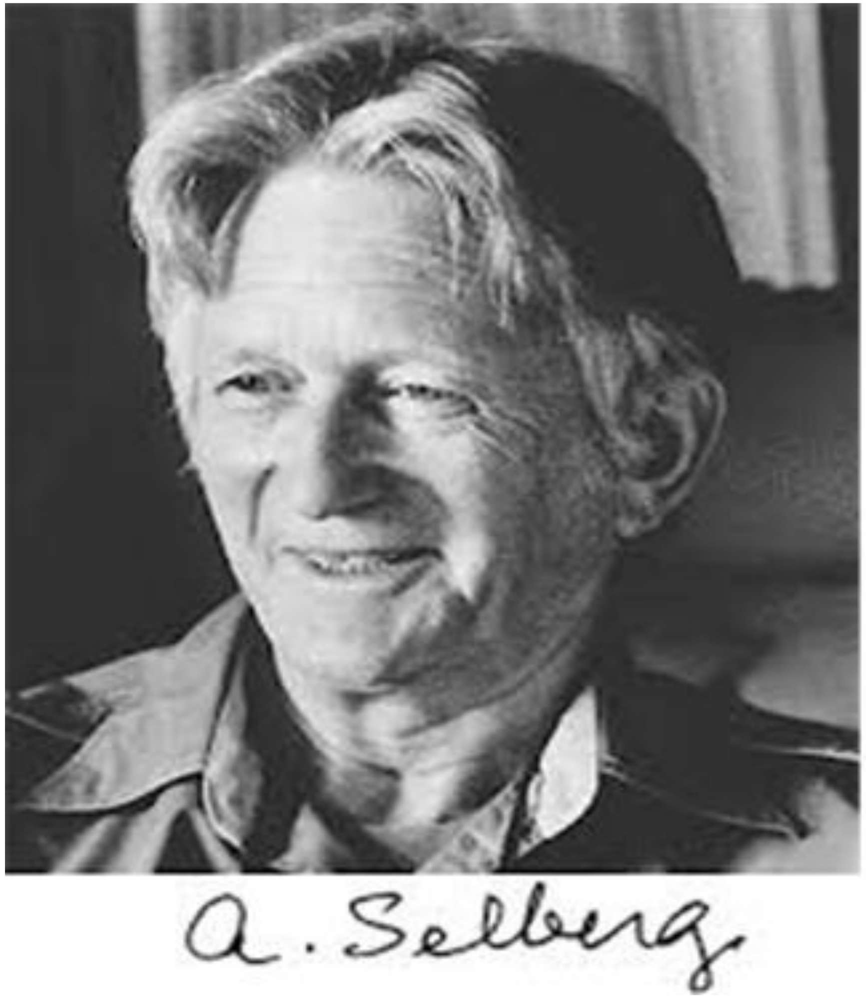
(1936-)

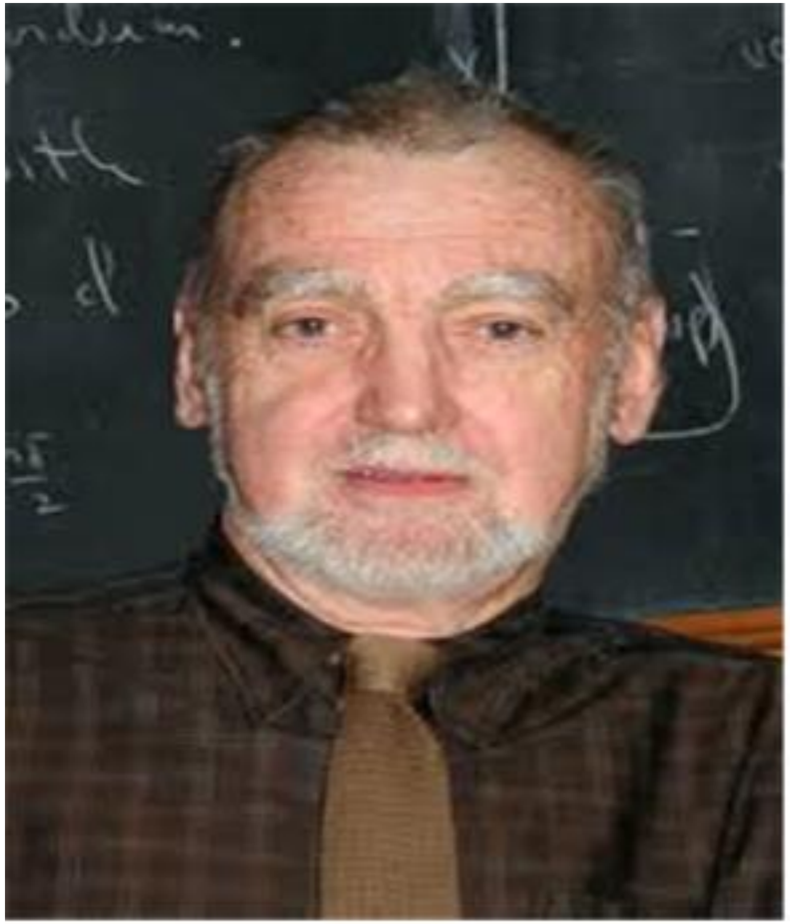
David Mumford

(1937-)

Carl Ludwig Siegel

André Weil





Robert Langlands

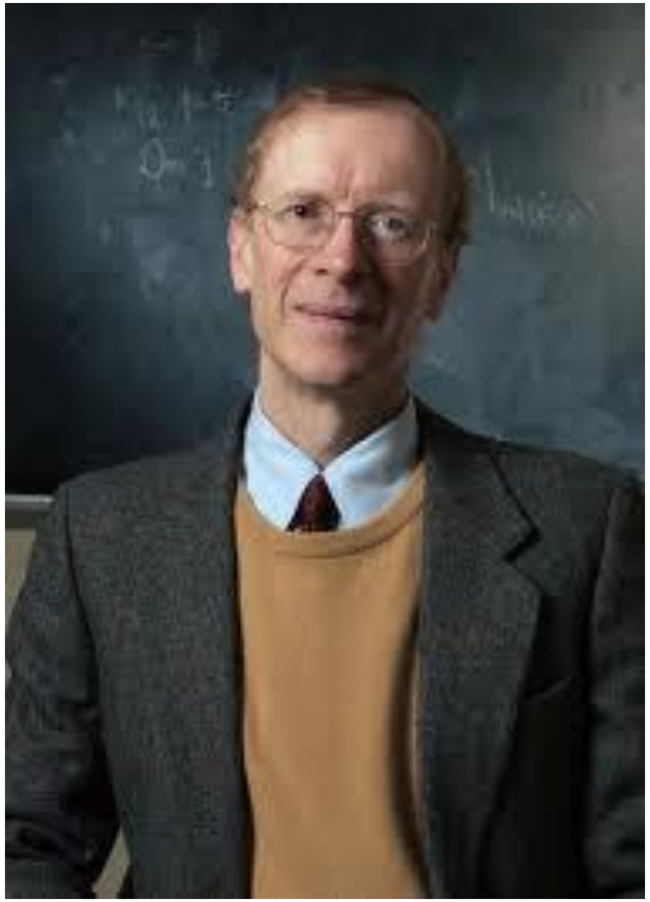
David Mumford

Eberhard Freitag

Mumford 와 Obama 대통령 (NMS)

Gerd Faltings

Wilfried Schmid



Andrew Wiles

Ichiro Satake

E. Freitag

[나의 조그만 연구결과]

[1] Holomorphic vector bundles over complex tori (Ph.D. 논문의 일부)

[2] Singular Jacobi forms 을 내가 발견한 새로운 미분작용소로 characterize 함

[3] The Siegel-Jacobi Operator 를 새롭게 소개하고 이것이 Hecke Operator 와 양립한다는 사실을 증명함. 이것을 이용해 Stable Jacobi Form 을 정의하고 이의 성질을 연구함. 이것에 관해 연구 할 것이 많이 남아 있음. 대수기하학, 무한차원의 Lie Group 의 기하와 표현론, Theta Series 와 관련이 있음.

[4] Construction of vector-valued modular forms from Jacobi form :

Mumford의 연구결과를 일반화함

[5] Harmonic analysis on the Heisenberg group $H_{\mathbb{R}}^{(n,m)}$

[나의 연구를 위해 적어본 것임]

[6] Kac-Moody algebras, the Monstrous Moonshine, Jacobi forms and infinite products [survey paper]

이 논문에서 이것들 사이의 연관성을 다루고, 이와 관련된 Open Problems을 제시함

[7] Harmonic Analysis on Siegel-Jacobi Space

$$G^J = Sp(n, \mathbb{R}) \ltimes H_{\mathbb{R}}^{(n,m)}$$

$$\mathbb{H}_{n,m} = \mathbb{H}_n \times \mathbb{C}^{(m,n)}$$

이 공간은 non-reductive symmetric space 임

- Invariant metrics and Laplacians
- Invariant differential operators
- Maass-Jacobi forms
- Orbit method for the Jacobi group
- The Schrödinger-Weil representation
- Theta sums
- Unitary representations of the Jacobi group
- Trace formula for the Jacobi group

[Number Theory, Algebraic Geometry, Analysis, Differential Geometry, Representations of a Lie Group, Quantum Mechanics, Quantum Optics etc]

[8] Harmonic Analysis on Minkowski-Euclid Space

$$GL_{n,m} = GL(n, \mathbb{R}) \ltimes \mathbb{R}^{(m,n)}$$

$$P_{n,m} = P_n \times \mathbb{R}^{(m,n)}$$

[Number Theory, Real Algebraic Geometry, Analysis,

Differential Geometry, Representations of a Lie Group etc]

젊은 수학자들과 이 토픽을 연구하고 싶음

[앞으로 할 연구과제]

[A] Harmonic Analysis on Siegel-Jacobi Space

[B] Harmonic Analysis on Minkowski-Euclid Space

[C] The Birch-Swinnerton-Dyer Conjecture

[D] Derivatives of L-Functions

[E] Langlands Functoriality Conjecture

상기의 연구결과를 저서로 남기고 싶다.

아름답고, 혁신적이고, 새롭고 심오한 연구결과를 얻기 위해 최선을 다하고 때를 기다리겠다.

[후회]

[1] 최선을 다하지 못했음. 나의 능력을 최대한 발휘하지 못했음

[2] 필요 없는 것에 금전, 정력과 시간 낭비함

[3] 개혁 혁신에 실패함. 이로 인해 대인 관계가 악화되어 적들이 많이 생김

[4] 정량적 평가 때문에 깊은 연구를 하는데 큰 지장을 받았음.

초연하게 대처하지 못한 것이 후회됨

[희망사항]

건강을 지속적으로 유지하며 최선을 다해 위대한 연구업적을 후세에 남기고 싶다.

그리고 이 위대한 업적을 한글로 작성해 한글의 우수성과 과학성을 전 세계에 알리고 싶다.

앞으로 훌륭한 제자를 1~2 명 배출하고 싶다.

$$M_{g,h,\mathscr{M}} := \det(Y) \cdot \det\left(\frac{\partial}{\partial Y} + \frac{1}{8\pi} \, {}^t\!\left(\frac{\partial}{\partial V}\right) \mathscr{M}^{-1} \left(\frac{\partial}{\partial V}\right)\right)$$

The *Siegel-Jacobi operator* $\Psi_{g,r} : J_{\rho,\mathscr{M}}(\Gamma_g) \to J_{\rho^{(r)},\mathscr{M}}(\Gamma_r)$ is defined by

$$(\Psi_{g,r} f)(Z, W) := \lim_{t \to \infty} f\left(\begin{pmatrix} Z & 0 \\ 0 & itE_{g-r} \end{pmatrix}, (W, 0)\right),$$

$$\mathcal{P}_{m,n} := \mathbb{C}[W_{11}, \ldots, W_{mn}], \quad W = (W_{kl}) \in \mathbb{C}^{(m,n)}$$

be the ring of polynomial functions on $\mathbb{C}^{(m,n)}$. Here $\mathbb{C}^{(n,n)}$ (resp. $\mathbb{C}^{(m,n)}$) denotes the space of all complex $n \times n$ (resp. $m \times n$)-matrices (see notation below). For any homogeneous polynomial $P \in \mathcal{P}_{m,n}$, we define the differential operator $P(\partial_W)$ on $\mathbb{C}^{(m,n)}$ as follows:

$$P(\partial_W) := P\left(\frac{\partial}{\partial W_{11}}, \ldots, \frac{\partial}{\partial W_{mn}}\right).$$

In this paper, the author proves that if P is a *homogeneous pluriharmonic* polynomial in $\mathcal{P}_{m,n}$ and $f \in J_{\rho,\mathcal{M}}(\Gamma_n)$ (see Definition 3.1) is a *Jacobi form* of index $\mathcal{M}$ with respect to a rational representation ρ of the general group $GL(n, \mathbb{C})$, then the following function

$$P(\partial_W) f(Z, W)|_{W=0}$$

yields a vector valued modular form with respect to a new rational representation of $GL(n, \mathbb{C})$. For precise details, we refer to Definition 5.1 and Main Theorem in Section 5.

C.L. Siegel [12] introduced the symplectic metric ds_n^2 on $\mathbb{H}_n$ invariant under the action (1.1) of $Sp(n, \mathbb{R})$ given by

$$ds_n^2 = \sigma\left(Y^{-1}\, dZ\, Y^{-1}\, d\overline{Z}\right) \tag{1.3}$$

and H. Maass [8] proved that the differential operator

$$\Delta_n = \sigma\left(Y\, {}^t\!\left(Y \frac{\partial}{\partial \overline{Z}}\right) \frac{\partial}{\partial Z}\right) \tag{1.4}$$

is the Laplacian of $\mathbb{H}_n$ for the symplectic metric ds_n^2. Here $\sigma(A)$ denotes the trace of a square matrix A.

In this paper, for arbitrary positive integers n and m, we express the G^J-invariant metrics on $\mathbb{H}_n \times \mathbb{C}^{(m,n)}$ and their Laplacians explicitly.

Theorem 1.1. *For any two positive real numbers A and B, the following metric*

$$
\begin{aligned}
ds^2_{n,m;A,B} = {} & A\sigma\left(Y^{-1}\,dZ\,Y^{-1}\,d\overline{Z}\right) \\
& + B\{\sigma\left(Y^{-1}\,{}^t V\,V Y^{-1}\,dZ\,Y^{-1}\,d\overline{Z}\right) + \sigma\left(Y^{-1}\,{}^t(dW)\,d\overline{W}\right) \\
& - \sigma\left(V Y^{-1}\,dZ\,Y^{-1}\,{}^t(d\overline{W})\right) - \sigma\left(V Y^{-1}\,d\overline{Z}\,Y^{-1}\,{}^t(dW)\right)\}
\end{aligned}
$$

is a Riemannian metric on $\mathbb{H}_{n,m}$ *which is invariant under the action* (1.2) *of the Jacobi group* G^J.

Theorem 1.2. *For any two positive real numbers A and B, the Laplacian* $\Delta_{n,m;A,B}$ *of* $(\mathbb{H}_{n,m}, ds^2_{n,m;A,B})$ *is given by*

$$
\begin{aligned}
\Delta_{n,m;A,B} = {} & \frac{4}{A}\Big\{\sigma\left(Y\,{}^t\!\left(Y\frac{\partial}{\partial\overline{Z}}\right)\frac{\partial}{\partial Z}\right) + \sigma\left(V Y^{-1}\,{}^t V\,{}^t\!\left(Y\frac{\partial}{\partial\overline{W}}\right)\frac{\partial}{\partial W}\right) \\
& + \sigma\left(V\,{}^t\!\left(Y\frac{\partial}{\partial\overline{Z}}\right)\frac{\partial}{\partial W}\right) + \sigma\left({}^t V\,{}^t\!\left(Y\frac{\partial}{\partial\overline{W}}\right)\frac{\partial}{\partial Z}\right)\Big\} \\
& + \frac{4}{B}\sigma\left(Y\frac{\partial}{\partial W}\,{}^t\!\left(\frac{\partial}{\partial\overline{W}}\right)\right).
\end{aligned}
$$

$$\left(\begin{pmatrix} P & Q \\ \overline{Q} & \overline{P} \end{pmatrix}, (\lambda, \mu; \kappa)\right) \cdot (W, \eta)$$

$$= \left((PW + Q)(\overline{Q}W + \overline{P})^{-1}, (\eta + \lambda W + \mu)(\overline{Q}W + \overline{P})^{-1}\right).$$

$$\Phi_*(W, \eta) = \left(i(I_g + W)(I_g - W)^{-1}, 2\, i\, \eta\, (I_g - W)^{-1}\right)$$

Theorem 1.3 *For any two positive real numbers A and B, the following metric $\mathrm{d}\widetilde{s}^2_{n,m;A,B}$ defined by*

$$\begin{aligned}
\mathrm{d}\widetilde{s}^2_{n,m;A,B} = {} & 4A\sigma((I_n - W\overline{W})^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) + 4B\{\sigma((I_n - W\overline{W})^{-1}\,{}^t(\mathrm{d}\eta)\mathrm{d}\overline{\eta}) \\
& + \sigma((\eta\overline{W} - \overline{\eta})(I_n - W\overline{W})^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\,{}^t(\mathrm{d}\overline{\eta})) \\
& + \sigma((\overline{\eta}W - \eta)(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}(I_n - W\overline{W})^{-1}\,{}^t(\mathrm{d}\eta)) \\
& - \sigma((I_n - W\overline{W})^{-1}\,{}^t\eta\eta(I_n - \overline{W}W)^{-1}\overline{W}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) \\
& - \sigma(W(I_n - \overline{W}W)^{-1}\,{}^t\overline{\eta}\,\overline{\eta}(I_n - W\overline{W})^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) \\
& + \sigma((I_n - W\overline{W})^{-1}\,{}^t\eta\overline{\eta}(I_n - W\overline{W})^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) \\
& + \sigma((I_n - \overline{W})^{-1}\,{}^t\overline{\eta}\eta\overline{W}(I_n - W\overline{W})^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) \\
& + \sigma((I_n - \overline{W})^{-1}(I_n - W)(I_n - \overline{W}W)^{-1}\,{}^t\overline{\eta}\eta(I_n - \overline{W}W)^{-1}(I_n - \overline{W})(I_n - W)^{-1} \\
& \times \mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W}) - \sigma((I_n - W\overline{W})^{-1}(I_n - W)(I_n - \overline{W})^{-1}\,{}^t\overline{\eta}\eta \\
& \times (I_n - W)^{-1}\mathrm{d}W(I_n - \overline{W}W)^{-1}\mathrm{d}\overline{W})\}
\end{aligned}$$

Theorem 1.4 *For any two positive real numbers A and B, the Laplacian $\widetilde{\Delta}_{n,m;A,B}$ of $(\mathbb{D}_{n,m}, d\widetilde{s}^2_{n,m;A,B})$ is given by*

$$\begin{aligned}
\widetilde{\Delta}_{n,m;A,B} = \frac{1}{A}\Big\{ & \sigma\Big((I_n - W\overline{W})\ {}^t\Big((I_n - W\overline{W})\frac{\partial}{\partial \overline{W}}\Big)\frac{\partial}{\partial W}\Big) \\
& + \sigma\Big({}^t(\eta - \overline{\eta}W)\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)(I_n - \overline{W}W)\frac{\partial}{\partial W}\Big) + \sigma\Big((\overline{\eta} - \eta\overline{W})\ {}^t\Big((I_n - W\overline{W})\frac{\partial}{\partial \overline{W}}\Big)\frac{\partial}{\partial \eta}\Big) \\
& - \sigma\Big(\eta\overline{W}(I_n - W\overline{W})^{-1}\ {}^t\eta\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)(I_n - \overline{W}W)\frac{\partial}{\partial \eta}\Big) \\
& - \sigma\Big(\overline{\eta}W(I_n - \overline{W}W)^{-1}\ {}^t\overline{\eta}\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)(I_n - \overline{W}W)\frac{\partial}{\partial \eta}\Big) \\
& + \sigma\Big(\overline{\eta}(I_n - W\overline{W})^{-1}\ {}^t\eta\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)(I_n - \overline{W}W)\frac{\partial}{\partial \eta}\Big) \\
& + \sigma\Big(\eta\overline{W}W(I_n - \overline{W}W)^{-1}\ {}^t\overline{\eta}\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)(I_n - \overline{W}W)\frac{\partial}{\partial \eta}\Big)\Big\} \\
& + \frac{1}{B}\sigma\Big((I_n - \overline{W}W)\frac{\partial}{\partial \eta}\ {}^t\Big(\frac{\partial}{\partial \overline{\eta}}\Big)\Big).
\end{aligned}$$

Letter of Professor Carl L. Siegel, University of Göttingen, Lower Saxony, (West) Germany.

Göttingen, March 3, 1964

Dear Professor Mordell.

Thank you for the copy of your review of Lang's book. When I first saw this book, about a year ago, I was disgusted with the way in which my own contributions to the subject had been disfigured and made unintelligible. My feeling is very well expressed when you mention Rip van Winkle!

The whole style of the author contradicts the sense for simplicity and honesty which we admire in the works of the masters in number theory-- Lagrange, Gauss or, on a smaller scale, Hardy, Landau. Just now Lang has published another book on algebraic numbers which, in my opinion, is still worse than the former one. I see a pig broken into a beautiful garden and rooting up all flowers and trees.

Unfortunately there are many "fellow-travelers" who have already disgraced a large part of algebra and function theory; however, until now, number theory had not been touched. These people remind me of the impudent behaviour of the national socialists who sang: "Wir werden weiter marschieren, bis alles in Scherben zerfällt!"*

I am afraid that mathematics will perish before the end of this century if the present trend for senseless abstraction-- I call it: Theory of the empty set-- cannot be blocked up. Let us hope that your review may be helpful.

I still remember the nice time we had together during your visit in Göttingen.

With best wishes, also to Mrs. Mordell,
Carl Siegel.

Louis J. Mordell (1888-1972)
Review of Lang's Diophantine Geometry
BAMS, vol. 70, 1964, pp. 491-498

Serge Lang (1927-2005)

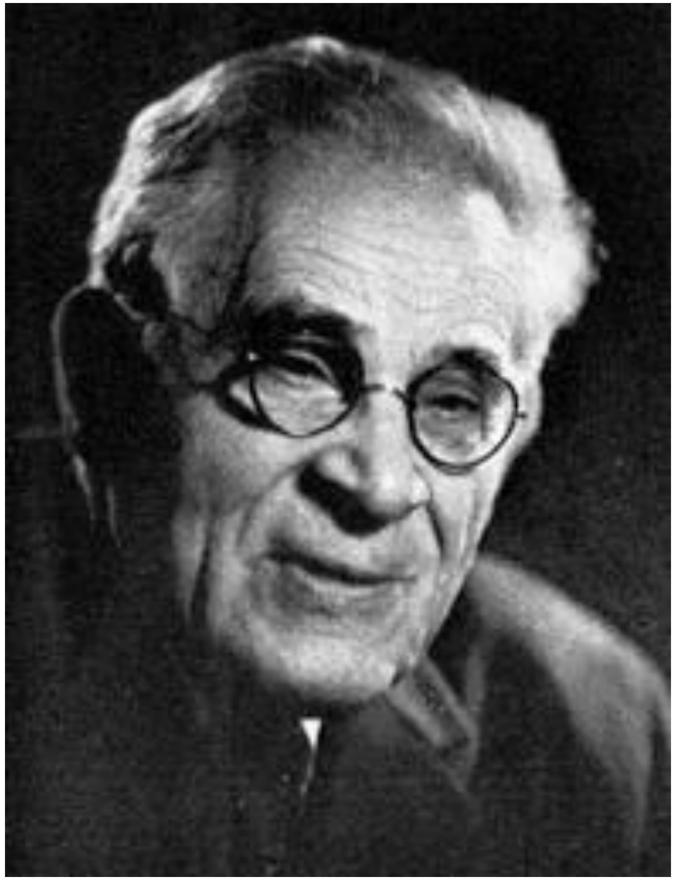
- Diophantine Geometry

Interscience, New York, USA (1962)

- Mordell's Review, Siegel's Letter to Mordell,

Diophantine Geometry and 20th Century Mathematics

[Notices of the AMS, vol. 42, no. 3 (March 1995)]

Louis Joel Mordell

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ON A. WEIL

YUTAKA TANIYAMA,
WITH TRANSLATION AND INTRODUCTION BY
MARK GORESKY AND KEIKO KAWAMURO

On A. Weil

Andre Weil is perhaps the best in the world, among active mathematicians, except for C. L. Siegel. [Weil is] a professor at the University of Chicago. He is outspoken. His criticism is harsh. His unbiased frankness, along with his broad viewpoint and deep insight, is one of the driving forces for the Bourbaki movement.

Earlier, I mentioned Weil's strength. Siegel, who is far more creative than Weil, also surpasses Weil in terms of strength. For the many mathematicians of our country, who love abstract formalism but lack strength, to strive for a depth of creativity would certainly hit them at their weak point!

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Taniyama Yutaka (谷山 豊, 1927-1958)

A Brief but Historic Article of Siegel

Rodrigo A. Pérez

Carl L. Siegel, Iteration of analytic functions, *Ann. of Math.* 43(2) (1942), 607-612.

Notices of the AMS, Vol. 58, No. 4 (April 2011), 558-566

Helene (Hel) Braun (1914 -1986)

Eine Frau und die Mathematik 1933-1940

Der Beginn einer wissenschaftlichen Laufbahn

Hrsg. Max Koecher [Jordan-Algebren : Springer 1966]

Springer-Verlag, Berlin-Heidelberg-NY (1989)


Hel Braun
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Max Koecher
Springer-Verlag

감사합니다